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HISTORICAL INTER-RELATIONSHIPS BETWEEN MEDICINE AND SOCIAL WELFARE *

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The vicious cycle of poverty and disease has posed one of the greatest problems confronting civilized society. Generations have been aware of the fact that poverty produces disease and that disease in turn produces poverty and destitution. The alleviation and prevention of poverty has been the primary concern of the social worker. The cure and prevention of disease has been the concern of the medical man. Conversely, in the nature of things, sickness has ever been a serious problem for social workers, while poverty has been part of the medical man's problem. The care and treatment of the sick poor has thus been the common meeting ground of both.

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For the sake of clarification I should like to define several terms used in this paper:

Social welfare, as used here, embraces all organized efforts at the prevention, care and treatment of poverty, dependency, delinquency and disease.

The term *philanthropist* is not used in the current sense of newspaper obituaries which identify all millionaires as philanthropists *per se*. I use it in its primitive sense, meaning a lover of mankind, not merely a money giver. Also, I use *humanitarian* not in the sense of one who is sentimetal towards dogs and little children, but as one actively concerned in the well-being of his fellowmen.

The geographic scope of the paper is limited to England and the United States.

These relationships have been dramatically underscored during such major misfortunes as epidemics and economic depressions. The disablement or death of breadwinners during major epidemics has often left in its wake orphans and widows dependent upon various forms of poor relief. Economic crises, in turn, cut off large masses of people from the means of subsistence, with deleterious effect on their health.

Up to the sixteenth century the care of the sick poor in England was mainly the responsibility of the monastic orders. The dissolution of the monastaries by Henry VIII gave impetus to the rise of secular institutions for this class.

There has been a tendency, however, to over-emphasize the effect of the break-up of English monasteries on the rise of secular hospitals and almshouses. The fact is that the same evolution was in process on the continent, as witnessed by the contemporaneous establishment of relief systems stressing civil responsibility in Ypres and Bruges in the low countries. When the great and neglected humanist, Juan Luis Vives, drew up his poor-relief plan for the town of Bruges, he urged adequate medical attention for the sick poor under municipal auspices, and made an eloquent plea for humane and intelligent treatment of the insane poor.

The Elizabethan poor law of 1601, drafted by the philosopher Francis Bacon and representing in essence a consolidation of previous Elizabethan legislation, was an important landmark in the history of both social welfare and public medicine. It was significant because it laid down the principle that each parish or town was responsible for the care of its own poor and that such relief was to be provided out of tax funds. It set up a plan for three types of institutions: an infirmary for the impotent, including the sick; a workhouse for the ablebodied poor willing to work, and a house of correction for the ablebodied poor *un*willing to work. The poor law of 1601 became the basis for public relief in England and America for the next three centuries. However, while it proposed the setting up of three different types of institutions, in actual practice each town usually built but one institution, called a workhouse or almshouse, in which the poor of every description, sick and well, were mixed indiscriminately. Gradually communities in both England and America adopted the

system of hiring " city " or " town " physicians to attend the destitute in their own homes at a stated annual salary. Public provision for the insane usually depended not on the patient's needs, but on the community's desire to protect itself against potentially dangerous persons. This class was confined in almshouses, jails or in " strong rooms " at home with little or no effort to provide medical care.

Two trends may be perceived in the rise of general hospitals in England during the early part of the eighteenth century. First there was the distinct tendency toward association in contrast to the *individual* philanthropy that had marked medical charities in the preceding century; secondly, there was a tacit understanding that hospital provision for the sick poor was a matter of private charity with a minimum of governmental interference. The attitude of the time was that the medical relief of the poor was best placed in private hands. The State was to deal primarily with the able-bodied poor, particularly with the " sturdy and valiant " vagrants and beggars, administering its police power toward their suppression.

The contemporary literature soliciting support of the voluntary hospitals of this period invariably follow a set pattern stemming from the fund-raising propaganda of the Westminster Hospital, founded in 1719 by a group of philanthropists. When Benjamin Franklin, as prime promoter of the Pennsylvania Hospital, prepared its prospectus in 1751 he lifted the phrasing almost in toto from the literature of contemporary English institutions. In young Dr. Samuel Bard's famous inaugural discourse of 1769, which led to the founding of the New York Hospital two years later, we find whole sentences and even paragraphs lifted from English sources.

It is an interesting experience, incidentally, to pore over the prospectuses and reports of these early hospitals. In their propaganda for support, the promoters skillfully played on the feelings of pity, fear, vanity, and common sense. The well-to-do were constantly reminded that labor was the source of all wealth—a doctrine widely accepted by the classic economists of the day—and that the accumulation of wealth would be greatly enhanced by restoring sick and disabled workers to their status as producers as quickly as possible. Their heart-strings were touched by portrayals of the misery and suffering of the sick poor who had no medical attention. Their interests as

taxpayers were aroused by pointing out that the families of sick and disabled workers constituted a heavy drain on the poor rates. The appeal to individual vanity was not neglected. The names of donors were prominently displayed in the literature; they were told how pleasing their contribution was in the sight of God. It should also be noted that the voluntary hospital movement of the eighteenth century was in the main organized by men of the middle class, who were highly gratified to sit on the boards of managers with members of the nobility whose patronage they solicited for their various philanthropies. Throughout the centuries this utilization of philanthropic endeavors, medical and otherwise, as a means of social advancement, has been a factor in the rise of such enterprises.

The early period of general hospitals was characterized by many crudities. Intended primarily for the poor, it was difficult for this class to gain access to them. Until the closing years of the century, it was commonly required that applicants for admission must first obtain a certificate from one of the patrons of the hospital, no matter how urgent the case. Days might have to be spent in tracking down one of these gentlemen for the requisite permit. Furthermore, in England it was the common practice to bar "pauper" or destitute persons from admission; these were referred to the parish or county workhouses. In America, however, provision was extended to the destitute also, setting up a difference in pattern that was to create a marked departure from the British scheme.

A practice that seems rather ghoulish from our present perspective, was a requirement that patients furnish some bond or surety to cover burial expenses should they fail to leave the hospital alive. While this rule was adopted at the Pennsylvania Hospital, it soon became the practice to ask for only a nominal surety of those unable to furnish the stated amount. Hence, we find such records as "John Bryan a poor person was admitted with large ulcers, a pair of buckles his security," and "a poor sailor was admitted with Rheumatism, his chest of cloathes his security." In 1798 the rule requiring poor patients to post security against funeral charges was repealed.

The second half of the eighteenth century, due to a complex of circumstances, witnessed a tremendous quickening of the humanitarian impulse. Without dipping too deeply into the well-springs of

the extraordinary awakening known variously as the Enlightenment and the "Age of Reason," I should like to discuss briefly several lines of cultural development that greatly influenced the course of contemporary philanthropy, medical and otherwise.

First there was the impact of the scientific revolution on the social thought of the time. Newtonian physics, with its emphasis on a natural law governing the harmony of the celestial spheres, stimulated leaders of thought to discover the natural laws that, they were certain, governed economic and social life as well. This quest led to inquiries into the life and problems of social groups that had hitherto been ignored. It encouraged an optimistic approach toward the future that Bury has aptly termed "the idea of progress." It also served as a convenient ideological basis for the economic aspirations of the rising middle class, which wanted a minimum amount of governmental interference with the "natural order" of free trade and competition.

Throwing off the theological shackles that fettered the minds of men, representative leaders turned away from fruitless absorption with problems of God and Devil, of Heaven and Hell, to increasing concentration on the problem of improving the condition of mankind here on earth. Medicine, too, shared in this general movement. The "evangelical conjunction" of priest and physician, as Cotton Mather called it, gave way to a new partnership; that of physician and philanthropist. In this connection, too, there was a subtle but significant change in the motivation of charitable enterprise, which shifted from a primary emphasis on religious duty to one of social responsibility. Alexander Pope expressed this trend in his famous couplet:

> Know then thyself, presume not God to scan,
> The proper study of mankind is man.

There was a new humanism, an extraordinary interest in the welfare of humankind. An insatiable curiosity for knowledge manifested itself in the representative men of the age. The frontiers of social thought were extended far beyond their former boundaries. It was an age that produced the greatest constellation of versatile genius the world had ever seen: Herder, Kant and Goethe; Montesquieu, Voltaire, Rousseau, Diderot, D'Alembert, Helvetius and Condorcet; Vico and Beccaria; Hume, Gibbon, Godwin and Bentham; Franklin,

Jefferson and Paine. Men remarkable for their breadth of knowledge, though not always for depth, and for their genuine humanitarian interests. Some, like Voltaire, might bitingly refer to man as "that speck of dust crawling about a ball of mud," but behind their irony was a deep and abiding sense of the solidarity of the human race. The dignity and worth of man, individually and collectively, was preached up in the poetry and prose of the period.

To a peculiar degree, the Friends or Quakers represented the quintessence of the economic stratum then rising to power. They were one of the earliest groups to adopt a sweeping set of democratic principles as part of their religious creed. In complete revolt against feudal concepts, they rejected ornate religious ceremonies, adopted habits of extreme simplicity, denied the idea of social distinction, emphasized good works as proof of true piety, deeply respected the status of labor and recognized the dignity of the individual. They were pioneers in the anti-slavery cause, in penal reform, and in public health and social welfare. Nearly every field of social reform bears the impress of their early activity. Their achievements are even more remarkable in the light of their relatively small numbers. Eminently practical in their work, they were the ideal apostles of the rational humanitarianism which characterized eighteenth-century philanthropy.

As early as 1714 an English Quaker, John Bellers, brimming over with ideas and plans for ameliorating the condition of the poor, presented a plan to Parliament which embraced a nation-wide system of public hospitals for the indigent, state-aided medical research laboratories, and adequate medical care for the sick poor in their own homes at public expense. John Howard, the pioneer prison and hospital reformer, was a Friend. Quaker physicians played a leading role in the progress of medical charities on both sides of the Atlantic. These included John Fothergill and John C. Lettsom in England and a large group of medical men in Philadelphia. The Pennsylvania and New York Hospitals, first of their kind in this country, were mainly founded by Friends. The York Retreat, in England, founded in 1792 on the principle of humane treatment of the insane, was the product of Quaker philanthropy. The Frankford Retreat and Bloomingdale Asylum, established here on the model of the York institution, were likewise founded by Quakers.

The late eighteenth century saw an extraordinary social awakening among medical men. The lives and works of the great doctors reflected in their spheres the insatiable curiosity, the warm humanity and the rationalism of contemporary leaders of social thought. John Fothergill was an active friend of the anti-slavery and prison reform movements. He was a liberal ministrant to the poor, whose generosity was by no means as calculating as suggested by his famous remark, " I climbed over the backs of the poor into the pockets of the rich." His protegé and disciple, John Coakley Lettsom, displayed an amazing fertility in ideas for the amelioration of human suffering. He wrote at frequent intervals pamphlets dealing with one or another aspect of health, medicine and social welfare. In 1801 these tracts were gathered together in a three-volume work entitled, " Hints Designed to Promote Beneficence, Temperance and Medical Science." One need only mention the subject-matter of some of these tracts to indicate the wide range of this man's interest: there are hints on the relief of poverty and distress, on various types of charitable agencies, on the prevention and cure of infectious fevers, on the relief of imprisoned debtors and other aspects of prison reform, on free schools for the poor, on the establishment of a free dispensary, and medical relief to the indigent in their own habitations. He was active in many private welfare agencies, and a leading founder of several of them.

An American prototype of Lettsom was Dr. Benjamin Rush, closely associated with most of the reforms of his day. Known to later generations as " the father of American psychiatry," he was a signer of the Declaration of Independence at thirty. His many published works include dissertations on politics, finance, medical theory and practice, ethics, war and peace, prison reform, abolition of slavery, educational reform, immigration, and so on. Another American doctor, Joseph Warren, played a prominent part in the social and political revolt in Boston which preceded the Revolutionary War. Dr. Warren neglected his lucrative medical practice to organize, with Sam Adams, Paul Revere and others, the Liberty Boys in Boston, and he lost his life at 34 as one of the brave defenders of Bunker Hill. A remarkable physician-philanthropist was the polymath, Samuel Latham Mitchill of New York, who was at various times professor

of Chemistry, botany, natural history, agriculture and materia medica at Columbia College, and who edited literary, philosophical and medical periodicals. A staunch Jeffersonian democrat, he served as a Congressman and Senator. He helped found many charitable institutions and agencies in New York City, and played an active part in their fund-raising drives. He was a prolific writer, and was known to some contemporaries as "a living encyclopedia," and to others as a "chaos of knowledge." Though his knowledge was necessarily wider than it was deep, he greatly stimulated both philanthropic and scientific efforts in his city and country.

Crossing to England again, we must give mention to Dr. Thomas Percival, of Manchester, an outstanding philosopher, physician and philanthropist in the last decades of the eighteenth century. A friend of most of the leading thinkers of Europe, he was the author of a classic work on Medical Ethics still in wide use, and of a number of scientific and philosophical treatises. He agitated successfully for reform of Manchester's bills of mortality, and persuaded the municipality to undertake a periodic census of the population. He conducted a pioneer survey of the cotton mills and the working-class of his town, which led him to denounce the terribly insanitary conditions of the cotton mills, and to demand better health and medical facilities for the poor. His work had a noticeable influence on later factory legislation.

I am not trying to suggest that all medical men of the late eighteenth century rushed *en masse* into the political and social movements of their day. What I wish to convey is that the men I have mentioned faithfully reflected a marked upsurge of social consciousness among contemporary physicians. There was a very close tie between medical men and philanthropists, resulting in the rise of many institutions and agencies for the relief of the sick and the poor. A striking feature of this relationship was the extensive and mutually beneficial inter-communication between medical and humanitarian reformers on both sides of the Atlantic. Medical philanthropy was intimately bound up with reform movements in other fields, such as penology, poor relief and the abolition of slavery.

The impact of the Industrial Revolution on the life of the people was an important factor influencing the ameliorative movements of

the time. This phenomenon, which involved radically new social and economic groupings, and transformed simple agricultural economies into comparatively complex urban societies, inevitably made necessary new orientations in the modes of serving the social, medical and other needs of the people. The acute and very noticeable misery of factory workers was another stimulus to social reform provided by the Industrial Revolution. The haphazard methods of small rural communities, where cases of sickness and indigence could be treated individually and casually as they arose, no longer obtained in large towns, which required permanent, stable agencies and institutions to cope with mass poverty and sickness. One particular point should be stressed, namely, that the accelerated rise of prisons, hospitals and poorhouses at the turn of the nineteenth century must all be considered part of the same movement, a general trend toward institutionalization.

During the eighteenth century medical and other charities were established by groups of private citizens eager to do good, going about it more or less rationally, but lacking the basic economic and social data whereby they could guage the effectiveness of their efforts. The early nineteenth century, on the other hand, was characterized in both England and America by (1) the initiation under public and private auspices of intensive inquiries into poverty and sickness with a view toward their prevention and amelioration, and (2) emphasis on legislation as a means of attaining these ends.

A major key to the philanthropic efforts of this period is to be found in the works of the great Utilitarian, Jeremy Bentham, whose cardinal belief was that the " greatest good of the greatest number " was the primary purpose of government. The vital test of all social institutions was the pragmatic one: " is it useful? " Society was not static, but dynamic, and could be perfected by the will and intelligence of man. He conceived of the Law as a supreme device for harmonizing the social relationships of men. Good laws made good men, and vice versa. He tried to create a science of legislation whereby salutary laws could be formulated with mechanical precision.

Although Bentham was a thoroughgoing apostle of the doctrine of *laissez-faire* in economic life, he firmly believed that governmental intervention was necessary to bring about equity and equilibrium in

the *social* sphere. He popularized a new concept of the police power of government. Denying that it should be used primarily for regulating the subject's duty to the sovereign, with the repression of the poor as one of its implied aims, Bentham saw police power mainly as a means toward attaining the Welfare State, based on the greatest good of the greatest number. It was in this spirit that he conceived a plan for a national health system under governmental direction and control. This idea was incorporated in his great Constitutional Code—laying down a model constitution for Britain. There he found place in the cabinet for a Minister of Health, who was to supervise the medical activities of the country, keep records, and make periodic reports and recommendations to Parliament for further health legislation. Bentham was essentially an eclectic. Most of his ideas were not original with him, but he displayed an amazing ability to synthesize the thinking of his liberal contemporaries. Much of what we call Benthamism really is derived from the general fund of the social philosophy of the time.

It was little wonder that the nineteenth century revolution in poor law and public health legislation in England was brought about largely through the work of two ardent disciples of Bentham—Edwin Chadwick and Dr. Southwood Smith. Both of these men started on their notable careers as social investigators in 1832.

In that year Dr. Smith was appointed a member of the national commission of inquiry into factory conditions. His exposure of the evil effects of long hours of work, under insanitary conditions, on the health of children helped pave the way for the factory and child labor legislation that followed, including the establishment of a national factory inspection system.

It was in this year, incidentally, that Dr. Smith played the leading role in a scene as bizarre, perhaps, as any in the annals of the nineteenth century. Jeremy Bentham died that year at the age of 84, requesting in his last will that Dr. Smith perform an anatomy on his body and preserve his skeleton in the interest of science. On a stormy night in June, 1832, Smith stood over his friend's corpse, which lay on the dissection table, in a room crowded with intimates of the late philosopher, and delivered a lengthy discourse on the master's theories. Having concluded, he set about dissecting his friend while

great claps of thunder shook the building. It is said that the lecturer's face was whiter than that of the cadaver. In accordance with the desire of the deceased, Dr. Smith later dressed the skeleton with Bentham's own clothing, mounted on it a waxen image of his head, and kept it in a mahogany closet in his office. It was later turned over to London University where, I believe, it still reposes.

Beginning with 1835, Southwood Smith made a series of masterful surveys on the relationship between disease and destitution in London. These studies, made at the behest of the Poor Law Commissioners, demonstrated impressively that outbreaks of epidemics among the poor were in large measure due to the wretched insanitary conditions under which they lived and worked. He prepared a very effective report, at the request of the Poor Law Commissioners, on the devastating typhus epidemic of London in 1837. Its title significantly read: "Report on the Physical Causes of Sickness and Mortality to which the Poor are Particularly Exposed and which are Capable of Prevention by Sanitary Measures." Subsequently, as a witness before a parliamentary committee, Dr. Smith, in discussing the slum evils of large towns, said: "These miseries will continue till the government will pass measures which shall remove the sources of poison and disease from these places. All this suffering might be averted. These poor people are victims that are sacrificed. The effect is the same as if twenty or thirty thousand of them were taken out of their wretched homes annually and put to death. The only difference is that they are left in them to die." Smith was one of the founders in 1839 of the Health of Towns Association, the first national public health society. He also helped organize in 1842, the Metropolitan Association for Improving the Dwellings of the Industrial Classes, which built the first model tenement houses, primarily aimed to keep out epidemic diseases. With Edwin Chadwick he played a leading part in the establishment of the first national Board of Health in 1848, and served on that Board with Chadwick and Lord Ashley.

The work of Edwin Chadwick is far better known than that of Southwood Smith. A disciple and former secretary of Bentham, Chadwick served on the famous Poor Law Commission of 1832, and was largely instrumental in framing the new Poor Law of 1834.

Thoroughly hard-boiled, somewhat lacking in the milk of human kindness, he nonetheless did more to raise the living standards of the poor than many a soft-hearted sentimentalist. He was a fanatical advocate of centralized administration and control of poor relief and sanitation. He made a fetish of efficiency, and hated waste, and in the pursuit of good government he spared no person's feelings. One of the greatest social investigators of all time, his reports as secretary of the Poor Law Commission still stand as models of effective compilation and interpretation of social data.

Chadwick's studies of pauperism naturally led him to an intensive investigation of sickness, one of its most fruitful causes. His subsequent recommendations for governmental health control characteristically were based not on pity for the poor, but on the desire to save public money. Consider the fourth annual report of the poor law commissioners (1838), written by Chadwick and referring to the study of epidemics made by Dr. Southwood Smith. It urges the introduction of sanitary measures as the most effective means of preventing pauperism. " All epidemics, and all infectious diseases," says the report, " are attended with charges, immediate and ultimate, on the poor rates. Labourers are suddenly thrown, by infectious diseases, into a state of destitution, for which immediate relief must be given. In the case of death the widow and children are thrown as paupers upon the parish. The amount of burdens thus produced is frequently so great as to render it good economy on the part of the administrators of the poor law to incur the charges for preventing the evils where they are ascribable to physical causes."

Chadwick's observations and experiences in poor relief led him to the crowning achievement of his career, the establishment of the Central Board of Health already referred to. In the process, he was broken by enemies of his fearless fight for health, and was forced into a premature and bitter retirement from public service.

The reports of Chadwick and Southwood Smith had their reverberations in the United States, as witnessed by Dr. John Griscom's report in 1845 on the condition of the labouring classes of New York City, obviously modeled on Chadwick's earlier survey of the working class of English large towns, and by Lemuel Shattuck's monumental public health survey of Massachusetts in 1850. Both the Griscom and Shattuck reports make free mention of Chadwick's studies.

Investigation and agitation constituted the outstanding features of reform movements in poor relief and public health during the first half of the nineteenth century. Intensive probings into the causes of pauperism led to the discovery, based on sound factual data, of the intimate relationship between disease and dependency. The rising science of statistics, which was early defined as the collection of social data pertaining to government with the avowed aim of improving society, proved to be a useful tool. The investigators of the time showed marked skill as agitators, fully conscious of the increasing importance of appeals to public opinion. The reports of Chadwick and others were no mere compilations of facts; they were deliberately directed toward stimulating public support of specific reforms.

A characteristic of the mid-nineteenth century was the work of individual crusaders for health and welfare. Typical among these was Dorothea Lynde Dix, whose thrilling deeds in getting the insane poor out of almshouses into hospitals for their special care is well known. Another American crusader was Miss Dix's friend, Dr. Samuel Gridley Howe, who fought for Greek independence soon after getting his medical degree at Harvard, directed the first school for the blind in America, pioneered in establishing special institutions for the feeble-minded, stood by John Brown in the abolitionist cause, served on the Sanitary Commission during the Civil War, and was president for many years of the first state board of charities, that of Massachusetts, in which capacity he became a leading theorist of public welfare.

This period witnessed an accelerated increase of hospitals, both general and special, public and private, in which philanthropist and physician once more joined hands. The 1860's in this country ushered in the establishment of state boards of charities and of health. Sometimes both functions were combined in a single authority, as in Massachusetts and California. Implicit in this development was the recognition of the need of state supervision in these fields, to check abuses and to stimulate improvement.

The 1870's witnessed the founding of several national organizations for the promotion of health and welfare. The American Public Health Association, established in 1872, and the National Conference of Charities and Correction (now the National Conference of

Social Work), organized in 1873, proved fruitful meeting grounds of medicine, health, and social welfare.

Important contributions to improved medical care of the sick poor were made by the State Charities Aid Association of New York, founded in 1872 by Miss Louisa Lee Schuyler. Although I have found no direct evidence to this effect, I believe this work may have been inspired by the existence of a strikingly similar society—The Central Society for the Promotion of Workhouse Visiting—established in England through the efforts of Miss Louise Twining. Both the English and New York State groups devoted much of their effort toward improved medical and nursing attention for inmates of poorhouses and hospitals alike. The State Charities Aid Association was largely instrumental in organizing the first training school for nurses at Bellevue Hospital. At that time a major part of the nursing service in the hospitals for the sick poor—commonly known as "pauper establishments"—was recruited from inmates of the poorhouse and penitentiary, and the S. C. A. A. and other organizations did much to substitute trained paid nurses for unpaid attendants whose only qualification was their destitution or delinquency. Exhibiting special interest in the plight of the insane, the S. C. A. A. played a leading role, too, in the passage of the famous State Care Act of 1890 in New York State, which prohibited the retention of insane persons in poorhouses, and established the first state care system for the insane in the country.

In the meantime forces were afoot which brought into being new fields of cooperation between medicine and social welfare. Three main problems of a social nature were troubling medical men:

1. How could they protect themselves from the imposition of people able to pay for medical care, but getting it free on the fraudulent plea of poverty?

2. How could they best obtain the social data helpful to the understanding of certain cases and their treatment?

3. What could be done to help rehabilitate certain types of discharged patients who required further supervision after leaving the hospital?

That the first problem was a disturbing one is amply evidenced

by the imposing literature on the subject of "the abuse of medical charities" which appeared in the professional journals at the turn of the present century. With medicine becoming increasingly conscious of the patient as a person, striving to treat the individual instead of the disease and extending its lines of inquiry into social phenomena, it inevitably called in social work as an adjunct to its ministrations.

Out of the crude charitable efforts of people interested in alleviating suffering, but more often than not lacking the background and knowledge needed to do it effectively, a new profession was rising. The Lady Bountiful type of voluntary worker was giving way to persons trained for the task of helping other people, and paid for their efforts. The charity organization movement, which had its beginnings in London in 1869, did much to stimulate the development of this profession of social work. Charity organization societies, originally directed mainly toward the goals of keeping chiselers off relief by thorough investigations of applicants, and coordinating the work of social agencies in the community, sprang up in many English and American localities. One of their basic premises was that unnecessary relief tended to demoralize the recipients, and they sternly set themselves to the task of cutting down this source of degradation, and, incidentally, to cut down the poor rates for the taxpayer's benefit. In the process, a corps of trained relief investigators was developed, later known as social workers. These by no means represented the whole field now called social work, but they are important for our immediate purpose.

A leading figure in the movement toward the end of the nineteenth century was Charles Loch, secretary of the Charity Organization Society of London. In 1892 an important article by Loch, entitled "The Confusion of Medical Charities," appeared in the periodical *Nineteenth Century*. "People," he wrote, "talk of medical charity as if it were a thing apart, unlike all other forms of charity to be regulated by no principles, to be bettered by no cooperation with others. . . . At the present time what more glaring picture of charitable impotence is there than that destitute persons should constantly apply to a free dispensary for drugs which cannot benefit them if they lack the necessary food; or that in the same illness they should go from one outpatient department . . . to another without heed being

paid to their actual condition? To be effectual, even to be equitably administered, medical charity must act in alliance with general charity. Their cause is one. Their difficulties are very similar. Each will succeed better with the help of the other."

As a means toward this end, Loch advocated the introduction of the trained social worker in the hospital, to supply the link between the institution and the world in which the patient lived. This worker was to have an intimate knowledge of the charitable resources of the community, medical or otherwise, and was to pass on applications for admission. His primary function was to check the abuse of medical charity. Applicants not requiring hospital care might be directed to more suitable agencies; the poor who needed such care would be admitted and also referred to other sources of aid should they require them; others who were destitute might be sent to the poor-law officers for assistance, and so on. In 1895 the Charity Organization Society of London, through Loch, provided a trained social worker to the Royal Free Hospital on an experimental basis. The experiment proved successful, and subsequently other English hospitals attached to their staff medical social workers, or hospital almoners, as they are called in England.

The movement had its inception in this country in 1905, when social service departments were inaugurated almost simultaneously at the Massachusetts General Hospital in Boston, the Bellevue Hospital in New York, and the Johns Hopkins Hospital in Baltimore. The name of Dr. Richard C. Cabot of the Massachusetts General, who wrote extensively on the subject, is most prominently connected with the beginning of the movement here.

At the same time, similar socializing trends were taking place in the field of institutional psychiatry. The mental hospitals, which had long been more or less isolated from the community, were gradually reaching out for the social data of patients, and this and other factors led to a convergence of psychiatry and social work which resulted in the creation of the psychiatric social worker. This development I have traced elsewhere. In this connection, brief mention should be made of the after-care movement, which arose from the difficult problem of helping discharged and paroled patients of mental hospitals to adjust to the social and economic environment of the normal com-

munity. Although the after-care movement had a long history in Europe, reaching back to 1829, its introduction in this country dates from 1906, when the State Charities Aid Association of New York formed an after-care committee to serve the Manhattan State Hospital. Others followed suit.

The early part of the twentieth century saw a tremendous upsurge of movements in which medicine and social welfare met and intertwined at many points. The accent in both fields shifted from amelioration and cure to prevention. The ideal now dominant found expression in the organization of a number of national societies having for their object the prevention and amelioration of specific types of poverty and disease. Among these significant groups founded in the early years of the century, the following may be mentioned:

The National Tuberculosis Association (1904),
The National Child Labor Committee (1904),
The National Committee for Mental Hygiene (1909),
The National Child Welfare Association (1912), and
The American Social Hygiene Association (1914).

All these endeavors brought together in common movements the men of medicine, health and social welfare. Since then the area of cooperation between medicine and social welfare has broadened so rapidly, that it would be impossible within the scope of this paper to do more than merely catalogue some of the common interests of the physician and the social worker. Prominent among these are public health generally; the prevention of the so-called social diseases such as tuberculosis, syphilis, and gonorrhea; abolition of the slums, and housing for low-income families; mental hygiene; care of the medically indigent; social security and social insurance; child labor and factory legislation; infant and maternal welfare; generally decent living conditions for the masses of people, whether viewed from the angle of health or welfare.

The list could be prolonged endlessly. However, I must arbitrarily bring this already over-long paper to a close. In conclusion, I would like to stress the point that the meeting ground of medicine and social welfare, which originally was confined to the area of actual destitution and disease, has steadily expanded to encompass mutual interest in nearly the whole range of human living. The range of

mutual endeavor is certain to expand in the future—that is, if civilization survives the current onslaught of barbarism. It must be said that the medical man has not always responded sympathetically to the offers of help and cooperation that came from the field of social welfare. A stiff-necked profession, jealous of its preserves and its prerogatives, medicine has tended to eye with suspicion the ameliorative and preventive efforts of social welfare, often regarding its representatives as crack-pots, meddlers, moon-struck idealists, and nasty blue-noses. While more medical men, in their roles as citizens as well as physicians, are interesting themselves in decent working and living conditions for the common people, large numbers have developed veritable phobias against anything with the label "social" on it. So rabid has this socio-phobia become that to whisper "socialized" in the ear of some doctors is like waving a red cloth before a bull.

Some of us, in pursuing our particular occupation or profession, tend to neglect our duties as citizens. This professional isolation, I feel, has ever acted as a major handicap to progress. The medical profession, the practice of which is highly individualized, particularly encourages this isolationism from the social environment. In spite of this, history shows—and I trust this paper reflects it—that the great doctors, besides making their *scientific* contributions to society, have made significant *social* contributions to the improvement of man's estate. They have not held aloof from progressive social movements; they have marched in the vanguard.

PROBLEMS OF PRIMITIVE MEDICINE

ERWIN H. ACKERKNECHT

Lacking a better expression, we call "primitive medicine" the medicine of the so-called "savage" or "uncivilized" people. We wish by no means to indicate by this expression that this medicine gives us a simple picture of the first stages of medicine. Although the medicine of these tribes is the main and almost the only source at our disposal for the study of these first stages, conclusions have to be drawn with extreme caution. These tribes and their culture have their own history, sometimes as complex and as tortuous as our own. From all that we know today, evolution followed not one, but multiple lines.

Although primitive medicine covers an enormous field in time and space, it has been studied to a surprisingly small degree by both medical historians and anthropologists. The approach taken especially by medical historians was not always a very happy one. Students either decided that certain primitives have no medicine at all, because their medicine fits so badly into our pattern of medicine, or they regarded it only as a mere immature or degenerate variety of our medicine. But our medicine is not *the medicine* nor our religion *the religion*, and there is not one medicine but numerous and quite different medicines in the different parts of the world and in the past, present and future.[1] Measuring everything with our everyday standards, we will never understand either the past or the future. Primitive medicine is not a queer collection of errors and superstitions, but a number of living unities in living cultural patterns, quite able to function through the centuries in spite of their fundamental differences from our pattern. This method of seeking in primitive medicine only for what it has in common with ours and of projecting into primitive medicine our categories leads to somewhat strange results. Demonology was put in the same class with bacteriology. Primitive medicine was studied by putting aside consciously every magic and

[1] 1 : 158. References are to numbers in the terminal bibliography, followed by page reference.

religious element [2] and served even as a model of logical and causal thinking.[3] There developed a myth of primitive "empiricism." A great handicap also was the clinging of medical historians to outmoded anthropological theories (Tylor, Spencer) and the permanent confusion with folk medicine. Folk medicine seems still to complicate the problem by its strange mixture of true primitive traits with degenerate high cultural elements.

The strong difference made by Levy-Bruhl between irrational primitive mentality and rational modern mentality may be discussed, although Lévy-Bruhl's real thought is much more sensible than his critics imply.[4] This pragmatic approach to the question proved to be more laborious, of course, but also much more fertile than any other method. But there can be no doubt that there is such an opposition between modern medicine based essentially on rationalism in spite of its magical elements and between primitive medicine based essentially on supernaturalism in spite of its rational elements. A short study of the most salient features of primitive medicine will show us that primitive medicine is essentially magic medicine.[5]

Primitive Medicine Is Magic Medicine

The expression "magic" is used here in a very broad sense as is sometimes done by anthropological authors.[6] "Magico-religious" should perhaps be more correct for the complex which concerns us. In the relatively little differentiated societies we are studying, magic and religion like their representatives have generally not yet differentiated from their common background.[7] The attempt of Rivers to classify the medical rites in the religious with respect to their more personal, propitious and ideal character, and in the magic with respect to their more coercitive, impersonal and utilitarian character has proved somewhat arbitrary and seems not to advance very much our understanding of the question.

Illness, like death or an accident, is generally not regarded by the

[2] 40 : 103.
[3] 79, 1924 : 44.
[4] 58 : III, 60 : 26.
[5] 30 : 20.
[6] 105 : 19; 84 : 419.
[7] See for the theory of this question 98 : 7189; 72 : 206; 110, 1927 : 376; 52 : 325; 86 : 60; 45; 24.

primitive as a natural event. It is the consequence of supernatural actions or forces. Even a cold may be explained by such causes.[8] Mystical object-intrusion, loss of the soul or one of the souls, spirit-intrusion, breach of the taboo, or witchcraft are the most common causes of illness. Very often not only one but several of them are accepted in one tribe.[9] The witchcraft theory which is distributed all over the world, leads especially in Africa to a kind of witch psychosis even more murderous than our own medieval outbreak.[10] The object-intrusion theory is absent only in the Eskimo districts and on the Asiatic continent. The soul-loss conception has its greatest elaboration among the Eskimos in Siberia and on the North Pacific coast. Of course the soul-notion of the primitive is quite different from our soul-notion. Often it is something rather material, like the kidney fat of the Australians, and can be eaten by the captor. The widespread spirit-intrusion, associated with exorcism and transference, seems most elaborated in the regions of higher culture (China, India, Egypt, Mexico). Again the spirit should not be regarded as the true spiritual being. It can be materialized in a snake, bird, etc. Taboo transgression unites in a strange blending of medical, juridical, economic elements on a religious background.

The belief in such causes can of course only occur in a world quite different from ours, in a magical world where the natural is supernatural but the supernatural quite natural,[11] where causality in our sense does not exist but things, animals and plants are tied together by mystical participations and moved by occult forces. Primitive causality is not afraid of contradictions and looks for the cause of a material effect in another supernatural dimension or vice versa,[12] because it sees no limits between the two realms.[13] That makes Mr. Evans-Pritchard say: "Indeed we may ask whether they have any notion that approximates to what we mean when we speak of physical causes." [14] Here is much more than the usual *post hoc-prop-*

[8] 58 : 19; 100 : 530.

[9] For the distribution and chronology of these conceptions see the valuable study of Clements in Univ. Cal. Publ. Am. Anthr., vol. 32, No. 2, pp. 185-252.

[10] 102 : 1321.

[11] 30 : 20.

[12] 58 : 85.

[13] 104 : 307.

[14] 26 : 315.

ter hoc fallacy. It is quite clear that this "logic" can never become more than the mother of pseudo-sciences. The primitive is not merely surprised by the unusual, because in his world everything is possible; but he reacts with intense emotion.[15] The emotion governs his thought and produces new images and delusions which he takes for realities.[16] .While our world had become the world of the *homo faber*, his is rather the world of the poet or the dreamer.[17]

Nevertheless among the countless tribes which do not know natural causes for disease [18] there are no doubt tribes which recognize natural causes for certain diseases.[19] The overemphasis of this fact created an entirely false picture of primitive medicine. After a closer examination a number of these cases appear as magic.[20] Some appear clearly as a result of European influence.[21] And the rest seem still so well integrated in the magical system that the primitive does not resent any contradiction between these and supernatural causes, does not feel compelled to employ this new system of thought. Instead it seems to be their very frequency that takes these diseases out of the emotional, magical, religious sphere.[22] The famous process of rationalization (Max Weber) is only its first beginning and magic has been submitted to ordeals like inquisition [23] and puritanism [24] before going to pieces.

To find out such unusual causes of disease unusual methods of diagnosis are needed and used. Every kind of divination, trance, astrology and dreams are the current methods. Among the Cherokees the latter method even produces the disease names.[25] Our experience stops at the frontiers of the natural. The most important part of the primitive's experience is on the other side of this frontier in his contact with the dead, the spirits, and the mystic ancestors. What for us is a mere hallucination is for him a privileged experience.[26]

The primitive's treatment is deeply embedded in the whole magico-

[15] 58 : 45. [16] 104 : 296. [17] 24 : 104.
[18] 92 : 99; 11 : 620; 16 : 156; 94 : 51; 51 : 18; 20 : 14.
[19] 34 : 197; 72 : 210; 89 : 103; 44 : 220; 63 : 269; 5 : 122.
[20] 34 : 51; 54, 57, 58, 64, 66; 69 : 67; 86 : 41; 79, 1925 : 46
[21] 86 : 45; 101 : 1257. [24] 107 : 513.
[22] 86 : 42, 34 : 21. [25] 77 : 337.
[23] 46 [26] 62 : 8, 23.

religious system, hence his extreme traditionalism, conservatism and conformity. Everything new is resented as highly dangerous, and fear, the kernel of primitive man's faith, makes him cling so closely to rules and customs. This traditionalism on the other hand makes him so surprisingly insensible to experience. Dreams again reveal very often the best ways of healing. Counter-magic with its different manual and vocal rites and dances, soul-hunts, exorcism, and purification are the most common irrational methods of healing. Of course they often contain measures which we now employ rationally as blood-letting, massage, baths and drugs. But they are employed in a magical sense. Amulets serve as magical preventive methods. The primitive treatment centers around symbolical actions, for the symbol is of enormous importance in primitive thought. But while our symbol dematerializes, the primitive symbol remains concrete and material, and permits action by mystical participation upon invisible forces which it cannot attain otherwise.

The mechanism of these participations becomes quite obvious in the much decried *couvade*.[27] The primitive father does not lie down as a result of laziness, but to protect his child. He takes the child's medicine [28] or the whole family confesses [29] or keeps a diet,[30] when one member is ill. The borderlines of primitive man's individuality are located differently from ours. As his treatment is magical and miraculous, it has to be strong and short.[31] He distrusts the long treatment of the white man.[32] His magico-religious ideas make the primitive sometimes not only flee the ill person,[33] but even kill him,[34] as he kills twins and monsters.[35] If we finally remember that time and space are qualitative in primitive man's thought, that his classifications separate what we unite and unite what we separate (men, plants, animals), that his medical thought is full of the conception of a mysterious power (mana, orenda, mori, ngye, etc.), we can only wonder about the identification of his "causality" and his "logic" with ours by some of the best students of this problem.[36]

[27] 69 : 342.
[28] 76 : 591 ; 59 : 486.
[29] 106 : 124 ; 61 ; 351.
[30] 91 : 352 ; 48 ; 12 ; 59 : 96.
[31] 102 : 1408.
[32] 58 : 468.
[33] 4 : 249.
[34] 52 : 42.
[35] 19, 1925 : 102.
[36] 86 : 51 ; 93 : 98 ; 79, 1924 : 44.

Is the Medicine Man the Ancestor of the Modern Physician?

Since Spencer, it has become a kind of axiom that the medicine man is the forefather of the modern physician. This strange personality is very often the first and only professional man in primitive society. His magic tries to produce prosperity in every field for his tribe and to fight its foes by magic. Very often the medicine man is not only magician, priest and sorcerer, but also chief and king, an almost superhuman being. His calling is generally inherited from the father or the maternal uncle. But being cured of a severe illness, being a twin, or becoming possessed may equally qualify him. A strange and widespread custom is his wearing of women's clothes.[37] He undergoes a very severe initiation and is surrounded by strong taboos, which isolate him from society. His costume, food, dwelling, customs (he does not work and sleeps during the day, being awake at night), name and language are different from the ordinary. He has his special drums and rattles, his magical stick and medicine bag. Sometimes he kills his own son to get more magical power. To fail is often very dangerous for him; the killing of the inefficient (or too successful [38]) medicine man is reported all over the world. Different even in death, he goes to another heaven than that of his fellow tribesmen.[39]

A careful analysis of both medicine man and modern physician reveal them rather as antagonists than as colleagues. All that they have in common is that both take care of diseases; everything else is different. The conservative medicine man plays his rôle as the most irrational man in an irrational pattern. The critical modern doctor [40] gains social leadership [41] by expressing the rational tendencies in society, rationalizing even the irrational as for instance the psychoanalyst, and invading in this way the oldest domain of the priest. The medicine man is rather the ancestor of the priest, the antagonist of the physician for centuries.[42] If there is any ancestor or colleague of the modern physician in primitive society, it is the lay healer, usually

[37] 55 : 129; 8 : 451; 70 : 88; 2 : 165.
[38] 5 : 212.
[39] 96 : II 208.
[40] 90 : 13.
[41] 33 : V.
[42] 77 : 980; 72 : 215.

a woman, the midwife.[43] This female lay healer is not to be confused with the female "medicine man," the priestess.[44] Though she is relatively nearer to empiricism, common sense or rationalism, it should not be forgotten that she also is entirely penetrated by the magic faith.[45]

We are fully aware that with the preceding short description of magic medicine, taking our examples from quite different cultures we sometimes oversimplified and built up one of those anthropological monsters which Ruth Benedict so wittily describes.[46] There is not one kind of primitive medicine; there are many. In Liberia it is the mystical power of the drug that heals; among the Bantu the power of the medicine man; among the Zuni the medical society.[47] Among the Navahos the greatest part of the religious ceremonial is primarily concerned with disease;[48] elsewhere it is entirely free from such purposes. Smallpox may be fled from in panic here and venerated there.[49] Here the medicine man is rich; there he is extremely poor.[50] Here he is priest, sorcerer, and magician in one person; there an extreme differentation takes place.[51]

Here medical practices are genuine; there they are imported and modified[52] etc., etc. The reason is quite obvious: "the significant sociological unit is not the institution but the cultural configuration."[53] Medicine is nowhere independent and following only its own motivations. Its character and dynamism depend on the place it takes in every cultural pattern; they depend on the pattern itself.[54] Therefore in order to reach a better understanding of the whole problem, we will describe in a following article the different medicines of some primitive tribes in relation to their different cultures.

The Stone of the Medicine Man

The question whether the medicine man is a deceiver or believes in his own practices seems to us of the greatest importance. It is

[43] 44:224; 103:288; 95:717; 86:68; 34:38; 78:8
[44] 38:27; 68:105; 70:80.
[45] 34:203; 64:35.
[46] 5:29; 66:125.
[47] 5:104, 34:13.
[48] 54:517.
[49] 31:108.
[50] 22.
[51] 38:27.
[52] 86:110.
[53] 5:244.
[54] 19:175, 184.

obvious that our whole attitude toward primitive medicine will depend on this question. Among people less acquainted with the subject, the former assumption prevails. It is highy interesting that among specialists only Sir J. G. Frazer defends this point of view.[55] It is also expressed by A. B. Ellis, Cator, Leonard and Read, but by the latter two with many limitations.[56] Still more limited are the accusations of Hrdlicka and Evans-Pritchard.[57] On the other hand Maddox reaches some conclusions, based on the writings of Kingsley, Sieroszewski, Hoffman, Laflesche, Roth, Nansen, about the proportion of quacks and frauds among primitive medicine men to those who are honest and sincere: " Investigation indicates the fact that the ratio of the false to the true among the uncivilized is practically the same as among the civilized." [58] May we mention further positive testimonials in favor of the subjective honesty of the medicine man by Boas, Rivers, Lowie, Harley, von Martius, Hill-Tout, Jerome Dowd, Howitt, B. Gutmann, Driberg, Hofstra, J. W. Hauer, Wright, Hubert-Mauss, Sumner-Keller, Stone, and Marett.[59] And it may be said that the majority of these men are not " armchair anthropologists " but field-workers.

There is no other practice that arouses as much suspicion about the treachery of the medicine man as his sucking out a stone (hidden before in his mouth) from the body of the patient. It seems to be just the same humbug as the stone of the medieval stonecutter, at least as long as we see things from our own medical standpoint and not from the point of view of the primitive. But as im Thurn [60] states: " This foreign substance, at least among the Indians of Guiana is often, if not always, regarded not as simply a natural body but as the materialized form of a hostile spirit." The conclusion is rather obvious: " Given the true point of view which is not empirical but transcendental the procedure is perfectly sincere and in its way rational. An invisible force is dealt with visibly by means that are meant and understood to be symbolic. An evil magician must

[55] 28 : 46.
[56] 23 : 128; 14 : 189; 56; 85 : 214.
[57] 44 : 223; 25, 1932 : 81; 25, 1933 : 320.
[58] 70 : 109.
[59] 7 : 594; 86 : 50; 65 : 315; 34 : 122; 73 : I 77, 419; 39; 18; 42; 355; 32 : 159; 21 : 236; 41 : 115; 35 : 395; 109 : 25; 45 : 186; 102 : 1359; 72 : 203
[60] 47 : 333.

have projected a crystal in the patient that is invisible. It becomes now necessary to provide a therapeutic in the form of a manual rite." [61] Or as Lévy-Bruhl [62] points out: "To destroy the misunderstanding it is sufficient to know that the extraction of the stone, insect, etc., in short, of the materialized disease, is by no means a sleight of hand. The doctor prefigures the intended expulsion of the evil influence. In the same way the Nagas in order to get a rich harvest, come down the slope where they planted the rice with their bodies bent forward as if the weight of the future harvest lay already on their shoulders." Similar conclusions are reached by H. Meyer [63] and F. E. Williams.[64] The patients know about the substitution. We should not forget that in some Indian tribes, for instance among the Dakotas,[65] the same characteristic stone is always used for the procedure, and consequently it is almost impossible for the patient and the public not to know the real fact. But this side of the question is not important for them. They still believe in the act because they believe in its symbolic effect. Besides, why should it be impossible for us to understand this mechanism, since the central rite of our religion, the eating of the savior's body and the drinking of his blood, is still based on a very similar symbolism?

The Reasons for the Success of Primitive Medicine I

Why primitive medicine and primitive mentality took this strange course, is still a riddle. We know of no biological difference between the savage and us which necessitated this course. But one thing seems to be certain: in its strange ways primitive medicine nevertheless fulfills its rôle.[66] In looking for the reasons for its effectiveness we may perhaps come nearer to an understanding of the whole problem.

There is no doubt that primitive medicine contains a sufficiently large number of objectively effective factors which we employ in a rational way: massage, bloodletting, dry cupping, baths, cauterization, surgery from appropriate fracture treatment to trephining; even inoculation against smallpox or snake bite are found among the

[61] 72: 208.
[62] 62: 277.
[63] 74: 43.
[64] 108: 354.
[65] 4: 24, 184.
[66] 34: 250.

uncivilized. But we should never forget that this, as well as isolating the sick or hidding the excrements or keeping a diet, is not done in a rational sense, but in an entirely magical sense accompanied by spells or prayers or manual rites or dances! The same holds true for native drugs which we find even among the most primitive tribes (Andamanese,[67] Australians,[68] Kubus,[69] Tasmanians [70]). The "spirit" of the herb fights against the disease "spirit." [71] It is amazing what an enormous number of effective drugs is known to the primitives. From twenty-five to fifty percent of their pharmacopoeia is often found to be objectively active.[72] Our knowledge of opium, hashish, hemp, coca, cinchona, eucalyptus, sarsaparilla, acacia, kousso, copaiba, guaiac, jalap, podophyllin, quassia and many others is a heritage from the primitive.[72a]

There is little doubt that further inquiries in the field of primitive plant lore, unfortunately wholly neglected by our too proud "synthetic" chemists, would still give very important results.

Even in the best textbooks of medical history the knowledge of these drugs by the primitive is generally derived from "empiricism," "observation," the "process of trial and error" (Castiglioni, Meyer-Steineg and Sudhoff, Neuburger, Diepgen, Pagel); only Cumston speaks of the instinctive state of medicine. But the strange fact is that such primitive empiricism was never observed. Besides it is a rather grotesque picture to imagine that the primitive should have taken the thousands of herbs and plants and tried one after the other until he had found out the few dozen effective drugs. We may like it or not; we may call it superstition or even stupidity like Preuss, Briffault, Ch. Richet; we may judge it a necessary way for the development of human thought; [74] in any case the first human thought we know and we observe is magical. Under the enormous pressure of his terrifying surroundings man starts to think; but he does not think rationally, in a "plain" and "natural" way with "common sense" about his tools, for instance, which he continues to handle in a rather instinctive way. He first creates supernatural causes and forces.

[67] 19, 1925 : 299.
[68] 81 : 321.
[69] 27 : 125.
[70] 9 : 285.
[71] 50 : 153.
[72] 97; 34 : 192; 77 : 323.
[72a] 10 : 471; 30 : 26; 69 : 184.
[74] 62 : 95.

On the other hand it is not very likely that magical thought could find or invent the effective drugs. As magical thought could gather them only by chance, and as they are otherwise too numerous to have been found only in this way, we have to look elsewhere for the sources of this drug knowledge. It is the merit of Artelt to have formulated and first proved the probable solution: " Neither empiricism or magic are the beginning of the inner application of drugs by men, but the animal function of instinct." [75] Just as the ill man and the ill animal still instinctively choose their food, just as the ill animal eats herbs and performs other reflex-like healing measures (rubbing, scratching, licking, sucking, blowing, extracting foreign bodies) in the same way man or pre-man chooses his herbs. If what we call instinct were finer or differently developed sense organs, " natural-somnambulic perceptions of primitive sense organs " as the school of Uexkull formulates it,[76] if there were specially endowed individuals leaving their knowledge to their heirs, we do not yet know it. In any case magic replaced to a certain degree " useful instinct-actions by unuseful actions of thought " (Preuss).[77] It counteracted surgery by mystical fears, perhaps introduced cannibalism,[78] paralyzed growing empiricism by its traditionalism, entangled the materially effective measures in an enormous body of materially useless acts and beliefs. Then only empiricism slowly grew up. The birth of scientific thought in the middle of the eighteenth century is just such a revolutionary act against every magical-religious influence that it first throws away everything with a magical past, the effective (opium, quinine, iodine, mercury) as well as the ineffective.[79]

The Reasons for the Success of Primitive Medicine II

" Although remedies acting through the mind were probably the earliest to be employed by man, the knowledge that the remedies act in this way is one of the most important recent acquisitions of medicine." [80] It is only since we have been applying psychotherapy consciously ourselves that we understand one of the main conditions

[75] 3 : 7.
[76] 29 : 228.
[77] 83 : 12.
[78] 52 : 254.
[79] 70 : 253.
[80] 86 : 122.

of the medicine man's success. There are too many well testified cases in primitive tribes where magic kills by suggestion for the fact to be doubted.[81] Why should the power that kills not be able to heal?[82] The medicine man is a soul doctor and his fellow primitive whom we know as an emotionalist needs him badly. He gives peace by confessing his patient. His rigid system, which ignores doubt, dispels fear, restores confidence, and inspires hope. And as Charcot said: the best inspirer of hope is the best physician. The primitive patient "comes into complete harmony with the infinite and as such, must of course be free of all ills and evils."[83] In a certain sense the primitive psychotherapist uses more and stronger weapons than the modern psychotherapist. He works not only with the strength of his own personality. His rite is part of the common faith of the whole community which not seldom assists in corpore at his healing act or even participates in singing and dancing. The whole weight of the tribe's religion, myths, history, and community spirit enters into the treatment. Inside and outside the patient he can mobilize strong psychic energies no longer available in modern society.

He unchains hypobulical mechanisms, and thinking with his whole body (Janet) he makes his patient think with his whole body. Here lies even one of the strongest points of primitive medicine. In spite of all that has been said and written about the soul-body problem, our thought is still dualistic. We still know illnesses of the body and of the soul. We differentiate between objective physical treatment and psychotherapy; and in my description, unable to employ other categories than those of my time, I too did so; but the primitive does not. He is no dualist. He knows only one kind of disease and one kind of therapy. When Rivers called primitive medicine "even more rational than ours, because its modes of diagnosis and treatment followed more directly from their ideas concerning the causation of disease"[84] the conclusion was grotesque, but the statement was correct. He may even have continued: and their ideas about disease are more closely

[81] 43: 42; 42: 769; 121: 468; 28: 321 ff; 72: 218; 102: 1326; 79, 1924: 178. G. H. Pitt-Rivers (82: 145) derives even the sterility of Polynesian women from psychological depression.

[82] 22: 533. [83] 54: 521. [84] 86: 52.

connected with their general thinking and feeling. We differentiate between the magical and the rational in their thought and behaviour, because we do it in our own. But they do not do the same. This unity of medical lore, this unity of the whole life and thought, makes primitive medicine so strong in a certain sense.

The Reasons for the Success of Primitive Medicine III

Primitive medicine is but a part of the magical system. This system is a pure creation of society. No special natural perception or association, these qualities being common in all races and cultures, builds this strange system. Society creates these collective representations; society conserves them *and they conserve society*. The strength of the magician and his own belief in himself is the consequence of the belief of the community. Magic is not built on experience; sensual experience never furnished the proofs of a magical judgment. " The general character and the apriorism of the magical judgments seems to indicate their collective origin." [85] Development of social organization, prior to technical development, is based on magical belief, and strange as it seems, magic forms an excellent cement for primitive society. It maintains public order without coercion.[86] If the chief is not the magician or medicine man himself, there is the closest cooperation between them.[87] Or in rather democratic forms of primitive government, he strengthens the influence of the old men's council which rules the tribe. " The social function of the sorcerer is therefore to preserve inviolate the power of the chief (who may or may not be a sorcerer himself), to suppress any anarchical or disorderly tendency, to give the community a sense of security in the face of known and unknown danger, to effect cures, to combat epidemics, to inflict injuries on the enemies of the clan, to counter the evil magic of the sorcerers of hostile tribes, to punish those who have offended the chief or the communal susceptibilities of the clan, and, in short, to hold the pulse of the tribe and sustain all those subtle influences that go to form the social cement that marks the difference between a community and a horde of men." [88] In a

[85] 45 : 126.
[86] 82 : 201 ; 70 : 287 ; 109 : 15 ; 85 : XIII ; 99 : III ; 141
[87] 71 : 75 ; 36 : 403. [88] 82 : 209.

social formation where primitive mentality dominates, the medicine man is a vital organ. It is no wonder that we find him everywhere.[89] It is no wonder that he is generally a strong personality, the man who was strong enough to undergo the initiation, who is strong enough to live isolated from his very community-minded fellows. He thinks for his people. He knows them quite well and uses that knowledge when, in the ordeal, he detects the culprits. He has an aura of secular and eternal power. And that, no doubt, helps him a great deal in healing.

The Reasons for the Success of Primitive Medicine IV

Besides its materially useful and psychotherapeutical characteristics, besides its social inter-relations, magic medicine sems to have another essential element of success. Magic medicine satisfies, much more than our medicine, a basic craving in humanity, a certain metaphysical need. We are generally very suspicious of such general statements. We have seen too many errors and fallacies in this way; but we cannot on the other hand refuse to recognize a general rule when facts seem to impose it.

" Man has among his most powerful instincts a kind of need for the ideal, a kind of deep and irresistible appetite for dreams, for the unreal. This tendency manifests itself imperiously and exteriorized in the primitive, restrained and perfected in the civilized, but quite precise in all epochs of history " (Hesnard).[90]

" Man is more proud of his metaphysical tendencies than of his scientific conquests; we have seen it already and we will see it without interruption when studying human history " (Le Dantec).[91]

" Every individual has a representation of the reality where he lives and acts, corresponding to the structure of his group. Here the spirits are attached to other things than to the objective relations on which practical activity and industry are based " (Lévy-Bruhl).[92]

" In the middle of the ruins of the old moral world stays still intact the triumphant column of religious need " (Michels).[93]

If they state it as a matter of fact or if they state it with deep anger

[89] 4 : 47; 62 : 31. [90] 37 : 167. [91] 53 : 54. [92] 58 : 93. [93] 75 : 47.

like the old super-materialist Le Dantec, if they call it ideal, religious, or metaphysical—they could still find other more or less precise names like emotional, irrational, etc.—all of them: psychologists, biologists, sociologists state the fact of this metaphysical need. Whether we like it or not, man has this irrational tendency,[94] his behaviour responds to this symbolical appeal to his unconscious.[95] "Throughout man's history it has been the mechanistic theory that he has found phantastic, not the animistic one." [96]

This need is still strong because in its fulfillment man finds a satisfaction never reached elsewhere. "Compared with ignorance, at least conscious ignorance—knowledge undoubtedly means a possession of its object; but compared with the participation which prelogical mentality realizes, this possession is never anything but imperfect, incomplete, and as it were external. It is the very essence of participation that all duality is effaced. Now the need of participation assuredly remains something more imperious and more intense even among people like ourselves than the thirst of knowledge and the desire of conformity with the claims of reason." [97]

Because magic gives this mystical unity which we feel so important, this deep satisfaction by metaphysical participation, it could be repressed, condemned to a hidden and almost unconscious existence (like ratio lives in primitive mentality) but it could not die, it still lives and acts.[98] As the primitive esteems his medicine man more than his lay-healer independently of their mutual effectiveness,[99] during centuries civilized men placed the physician higher than the surgeon even though the usefulness of the latter may have been much greater than the usefulness of the former. It is not by chance that Lewis Carroll's "Alice in Wonderland," the spirit of which is so near to primitive mentality,[100] became one of the most influential books in English literature. Since Sighele's discovery of the relationship between the mentality of sects and primitive mentality, we have been more attentive to these questions. In a small, but very intelligent book, *Hidden Religions*, C. C. Bry describes the magical character

[94] 67: 234; 24: 344.
[95] 87: 51.
[96] 6: 636.
[97] 57: 384.
[98] 49: 349; 88: 10; 28: 56; 60: 26
[99] 70: 118.
[100] 49: 347.

in such movements as Esperanto, Sex-Reform, Christian Science, Anti-Alcoholism, Anti-Semitism, Occultism. We are witnesses of a strange hunger for idols in the masses (dictators, film stars, etc.). We observe the mystical transformations that scientific discoveries undergo in popular thought (vitamins, microbes, etc.). Some thirty years ago W. G. Sumner announced another outburst of magical thinking and feeling in our society. Unfortunately it seems that he was not mistaken.

To understand primitive medicine, we had to go very far from our standards and concepts. But these apparently very remote studies are by no means unrelated to our time. Besides presenting their problems to us, they led us back to some of our own problems and thus appear as a legitimate branch of real social sciences.

BIBLIOGRAPHY

1. Ackerknecht, E. H., Beiträge zur Geschichte der Medizinal-reform 1848, Arch. f. Gesch. d. Med. 1932, pp. 61-183.
2. Aichel, O., Die Heilkunde der Ureinwohner Chiles, Arch. f. Gesch. d. Med. 1913, pp. 161-204.
3. Artelt, W., Studien z. Gesch. der Begriffe "Heilmittel" und "Gift," Leipzig 1937.
4. Bartels, M., Die Medizin der Naturvölker, Leipzig 1893.
5. Benedict, R., Patterns of Culture, Boston 1934.
6. Benedict, R., Religion in Boas F: General Anthropology 1938.
7. Boas, F., The Central Eskimo, Bur. Am. Ethn. Rep. VI, Washington 1890.
8. Bogoras, W., The Chukchee, Mem. Am. Mus. Nat. Hist. vol. XV, New York 1901.
9. Bonwick, J., Tasmanians, London 1898.
10. Bourke, J. G., The Medicine Men of the Apache, BAE-R 1892.
11. Bourlet, A., Les Thay, Anthropos 1907.
12. Brough-Smyth, R., The Aborigines of Victoria, London, Melbourne 1878.
13. Bry, C. C., Verkappte Religionen, Gotha 1924.
14. Cator, D., Among the headhunters, New York 1905.
15. Clements, F. E., Primitive concepts of disease, Berkeley 1932.
16. Cummins, S. L., Sub tribes of Bahi-el-Ghazal Dinkas, J. Anthr. Inst. 1904.
17. Cumston, C. F., History of Med., New York 1926.
18. Dowd, J., The Negroe Races, New York 1907.

19. Dewey, J., Interpretation of the savage mind in Thomas W. J., Source-book, Chicago 1909.
20. Dieterlen, H., La médecine et les médecins au Lessouto, Paris 1930.
21. Driberg, I. H., The Lango, Oxford 1923.
22. Dundas, K. R., The Wawanga, JAI 1913.
23. Ellis, A. B., The Tshi-speaking peoples, London 1887.
24. Essertier, D., Les formes inférieures de l'explication, Paris 1927.
25. Evans-Pritchard, E. E., The Zande corporation of witch-doctors, JAI 1932.
26. Evans-Pritchard, E. E., Witchcraft, Oracles and Magic Among the Azande, Oxford 1937.
27. Forbes, H. O., On the Kubus of Sumatra, JAI 1885.
28. Frazer, J. G., The golden bough, one vol. ed., London 1924.
29. Fritsche, H., Der Erstgeborene, Berlin 1941.
30. Garrison, F. H., An Introduction to the History of Med., Philadelphia, London 1929.
31. Gurdon, R., Khasis, London 1907.
32. Gutmann, B., Dschagga, Leipzig 1909.
33. Haggard, H. W., Mystery, Magic, Medicine, New York 1933.
34. Harley, G. W., Native African Medicine (Mano of Liberia), Cambridge Mass. 1941.
35. Hauer, J. W., Die Religionen, Berlin 1923.
36. Herscovits, M. J., The economic life of primitive peoples, New York 1940.
37. Hesnard, A., Les psychoses et les frontières de la folie, Paris 1924.
38. Hewat, M. L., Bantu Folklore, Cape Town 1906.
39. Hill-Tout, C., British North America, Toronto 1907.
40. Hofschlaeger, R., Die Entstehung der primitiven Heilmethoden, Archiv für Gesch. d. Med. 1910, pp. 81-103.
41. Hofstra, S., Differenzierungserscheinungen in einigen afrikanischen Gruppen, Amsterdam 1933.
42. Howitt, A. W., Native tribes of Southeastern Australia, London 1904.
43. Howitt, A. W., On Australian medicine-men, JAI XVI.
44. Hrdlicka, A., Physiological and Medical Observations Among the Indians of S W Un. St., BAE-B 1908.
45. Hubert, H. et Mauss, M., Esquisse d'une théorie générale de la magie, Année sociol., vol. VII, Paris 1902, pp. 1-146.
46. Hubert, H., Revue de Thorndike: History of Magic, Année sociol., Paris 1924, p. 479.
47. Im Thurn, F., Among the Indians of Guiana, London 1883.
48. Karsten, R., Blood revenge among the Jibaro Indians, BAE-B 1923.
49. Keith, A., Address, Janus 1926, pp. 344-352.
50. Kingsley, M. H., West African studies, London 1899.

51. Kleiweg de Zwaan, J. P., Die Heilkunde der Niasser, Haag 1913.
52. Koty, J., Die Behandlung der Alten und Kranken bei den Naturvölkern, Stuttgart 1934.
53. Le Dantec, F., Traité de Biologie, Paris 1911.
54. Leighton, A. H. and D. C., Elements of Psychotherapy in Navaho Religion, Psychiatry, IV, pp. 515-523.
55. Leiris, M., Le culte des Zâr̂s à Gondar, Aethiopica t. II, n. 4, Paris 1934.
56. Leonard, A. G., Lower Niger tribes, London 1906.
57. Lévy-Bruhl, L., Les fonctions mentales dans les sociétés inférieures, Paris 1910.
58. Lévy-Bruhl, L., La mentalité primitive, Paris 1922.
59. Lévy-Bruhl, L., L'âme primitive, Paris 1927.
60. Lévy-Bruhl, L., H. Spencer lecture, Oxford 1931.
61. Lévy-Bruhl, L., Le surnaturel et la nature dans la mentalité primitive, Paris 1934.
62. Lévy-Bruhl, L., L'experience mystique et les symbols chez les primitifs, Paris 1938.
63. Lindblom, G., The Akamba, London 1920.
64. Lipinska, M., Histoire des femmes médecins, Paris 1900.
65. Lowie, R. H., An introduction to cultural anthropology, New York 1934.
66. Lowie, R. H., The history of ethnological theory, New York 1938.
67. Lynd, R. S., Knowledge for what?, Princeton 1939.
68. MacDonald, East Central African Customs, JAI, XXII.
69. McKenzie, D., The infancy of medicine, London 1927.
70. Maddox, J. L., The Medicine Man, New York 1923.
71. Malinowski, B., Argonauts of the Western Pacific, London 1922.
72. Marett, R. R., Psychology and folklore, London 1920.
73. Martius, K. F. P. von, Beiträge z. Ethnographie u. Sprachenkunde Brasiliens, Leipzig 1867.
74. Meyer, H., Wunekau, Anthropos 1933.
75. Michels, R., Les partis politiques, Paris 1914.
76. Moffat, R., Missionary labours in South Africa, London 1846.
77. Mooney, J., The sacred formulas of the Cherokees, BAE-R 1891.
78. Neuburger, M., History of Medicine, London 1910.
79. Niewenhuis, A. W., Die Anfänge der Medizin unter den niedrigst entwickelten Völkern, Janus 1924, 1925, 1926.
80. Niewenhuis, A. W., Principles of Indian Medicine in American Ethnology, Janus 1924.
81. Palmer, E., On some Australian tribes, JAI 1884.
82. Pitt-Rivers, G. H. L. F., The clash of culture and the contact of races, London 1927.
83. Preuss, K. T., Die geistige Kultur der Naturvölker, Leipzig, Berlin, 1923.

84. Preuss, K. T., Der Ursprung der Religion, Globus LXXXVII.
85. Read, C., The origin of man and his superstitions, Cambridge 1920.
86. Rivers, W. H. R., Medicine, magic and religion, London 1924.
87. Rivers, W. H. R., Psychology and politics, London 1923.
88. Robinson, V., The story of medicine, New York 1931.
89. Roscoe, J., The Bahima, JAI 1907.
90. Rosen, G., Disease and social criticism, Bull. Hist. Med. 1941, t. X, No. 1.
91. Roth, W. E., The animism and folklore of the Guiana Indians, BAE-R 1908.
92. Rougier, E., Maladies et médecins à Fiji, Anthropos 1907.
93. Saintyves, P., Les origines de la médecine, Paris 1920.
94. Schweitzer, A., Zwischen Wasser und Urwald, München 1926.
95. Sigerist, H. E., Developments and trends in gynecology, Am. J. Obst. Gyn., 1941, Vol. 42, pp. 714-722.
96. Skeat, W. W. and Blagden, C. O., Pagan races of the Malay Peninsula, London 1906.
97. Smith, E. W. and Dale, A. M., The Ila-speaking peoples of Northern Rhodesia, London 1920.
98. Soustelle, J., L'homme et le surnaturel, in Rivet, P., L'espèce humaine, L'Encyclopédie Française, t. VII, Paris 1936.
99. Spencer, H., Principles of sociology, New York 1904.
100. Spencer, B. and Gillen F. J., Native tribes of Central Australia, London 1899.
101. Spix, J. B. von and Martius, C. F. P. von, Reise in Brasilien, München 1831.
102. Sumner, W. G. and Keller, A. G., The Science of society, New Haven 1927.
103. Thomas, W. I., The relation of the medicine man to the origin of the professional occupation, in Source book for social origins, Chicago 1909.
104. Thurnwald, R., Primitives Denken, Eberts Reallexikon d. Vorgesch. t. X.
105. Thurnwald, R., L'économie primitive, Paris 1937.
106. Turner, G., Samoa, London 1884.
107. Weber, M., Gesammelte Abhandlungen zur Religionssociologie, Tübingen 1934.
108. Williams, F. E., Papuans of the Trans-Fly, 1936.
109. Wright, J., The primitive medicine man's virtues, New York Med. J. 1917.
110. Wright, J., Primitive Medicine, Medical Life 1924-1938.

PRIMITIVE PSYCHIATRY II *

III

Funeral Suicide and the Mohave Social Structure

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The complete institutionalization of funeral suicide among the Mohave Indians is functionally connected with certain basic aspects of Mohave society, culture and social psychology. This nexus is easily demonstrated once the external features of this institution are suitably correlated with major Mohave beliefs and customs. From the socio-cultural point of view this institution may furthermore be likened to Kardiner's " secondary institutions," which provide checks and balances for basic institutions [1] somewhat in the manner of Lowell's functional analysis of conjugate principles.[2]

On the other hand the institution under study has certain paradoxical and distinctive features whose analysis is beset with many difficulties, and which, nevertheless, reveal certain socio-cultural and psychological mechanisms so general and so significant, that a study of this behavior-pattern must necessarily transcend the limits of mere ethnography, and approximate the methods of investigation characteristic of psychiatry and sociology.

In the last resort the institutionalization and social recognition of this pattern demonstrates the flexibility of culture which, though not unlimited, yet is capable from time to time of articulating anti-social or asocial forces with the total social structure. The fact that these disruptive forces are both social and psychological compels us to adopt at first a dual approach, in the hope of blending two sets of findings into a final functional whole.

The observation that disruptive forces and modes of behavior can be, and often are, standardized and perhaps even institutionalized, is by no means an original feature of this essay.

* Cf. *Bulletin of the History of Medicine* 8: 1194-1213, 1940.
[1] Kardiner, A., *The Individual and His Society*. New York, 1939.
[2] Lowell, A. L., *Conflicts of Principle*. Cambridge, 1932.

F. Stuart Chapin [3] in particular has time and again stressed the social importance of latent culture-patterns, by insisting that we recognize that organized anti-social factors are an integral part of the social landscape.

Frank Tannenbaum [4] in turn has investigated crime and criminal behavior from a highly institutional point of vantage, and has conclusively demonstrated that the criminal world has a genuine subculture of its own, which is as authentic as the folkways and mores of the criminal tribes of India.[5]

Ralph Linton [6] has brought these findings into a sharp focus by developing the concept of "patterns of misbehavior." This term aptly emphasises the fact that society and culture tend to prescribe certain rules of conduct for those engaging in socially prohibited activities, such as adultery, petting etc. Paraphrasing Linton's statement: Society tells the individual "Avoid engaging in such and such activities, but if you do engage in them, you shall proceed thus and thus." Certain "patterns of misconduct," or at least certain phases thereof, tend even to become articulated with the highest cultural standards. Even adultery is condoned if committed by a gentleman who protects the good name of his mistress. (I. e.: "A Southern gentleman is someone who would rather commit adultery than mention the word in front of a lady.") A distinguished psychiatrist once speculated within this writer's hearing on whether the prestige to be gained by repentance and confession is an active factor in the commission of sins. In all these cases, however, only a certain phase of the pattern of misconduct has become incorporated into the social structure, and then as a mere *marginal* institution, or else as an "alternative" in Linton's sense.[7] The distinctive aspect of the

[3] Chapin, F. S., Latent Culture Patterns of the Unseen World of Social Reality. *American Journal of Sociology* 40: 61-68, 1934, *id.*, *Contemporary American Institutions*. New York, 1935.

[4] Tannenbaum, F., *Crime and the Community*. Boston, 1938.

[5] Cox, Sir E., *Police and Crime in India*. London, 1911.—Cressey, P. F., The Criminal Tribes of India. *Sociology and Social Research* 20: 503-511, 21: 18-25, 1936.—Hasanat, Abul, *Crime and Criminal Justice*, Standard Library, Dacca, Bengal, India. (Reviewed by Owens, C. D. (*in*) *Journal of Criminal Psychopathology* 3: 169, 1941.)

[6] Linton, R., *The Study of Man*, New York, 1936.

[7] Linton, *op. cit.*

institutionalization of Mohave funeral suicide is that, unlike patterns of misconduct or periods of licence (Australian corroborees, Roman Saturnalia), it has been absorbed in its integrity by the social structure.

The writer has attempted to generalize these findings by developing the concept of " Social Negativism " [8] though even that analysis did not proceed beyond the concept of negative institutions existing in interstitial or marginal areas of the social structure, or as more or less tolerated alternatives of positive ones. (Using Linton's terminology, a positive institution is functional in that it contributes something to the maintenance of the social structure as a whole, while a negative institution is essentially a dysfunctional one.)

Even this broad pattern is not sufficient for an analysis of Mohave funeral suicide, which, though basically dysfunctional, has, through the process of institutionalization, become a functional one, and, as such, part of the Mohave individual's security system. Mohave culture, perhaps because of its lack of rigidity, has been realistically skillful in transforming dysfunctional patterns into functional ones, since not merely funeral suicide, but perhaps also homosexuality [9] and possibly other negativistic forces [10] have been successfully articulated with the social structure and thereby made functional.

It is my purpose to analyze this paradoxical and distinctive aspect of funeral suicide among the Mohave Indians.

Case Histories

1) Mu:θ of the Mu:θ gens, a full-blood Mohave Indian woman about forty years old attempted to jump on the funeral pyre of her son Calea-I:wa (Sand-Heart) of the Ñoltc gens. Sand-Heart was a full-blood Mohave, about twenty years of age. This attempt occurred on the cremation-grounds of Needles, California, at about

[8] Devereux, G., Social Negativism and Criminal Psychopathology. *Journal of Criminal Psychopathology* 1:323-338, 1940, *id.*, Maladjustment and Social Neurosis. *American Sociological Review* 4:844-851, 1939.

[9] Devereux, G., Institutionalized Homosexuality of the Mohave Indians. *Human Biology* 9:498-527, 1937.

[10] Devereux, G., Der Begriff der Vaterschaft bei den Mohave Indianern. *Zeitschrift für Ethnologie* 69:72-78, 1937.

1:00 p. m. some twenty-odd years ago (1916?). This woman had lost both her parents, but her husband was alive. The attempt was frustrated by informant (Hivsu:Tupo:ma, a shaman and funeral orator), and others. They dragged her away and poured cold water on her until she quieted down.

2) Cu:ly of the Cu:ly gens, a Mohave woman aged twenty, tried to throw herself on the funeral pyre of her husband Amo:ce kwaki:yo (Mo:ce-carrier. Mo:ce is an edible plant of which this man was so fond that he always carried some of it on his person). The husband was a full-blood Mohave of the Mu:θ gens, aged about thirty. He died of hiku:pk (syphilis). Just before the cremation ceremony the wife repeatedly declared that she would throw herself on the pyre. When, toward 4:00 or 5:00 p. m., the pyre began to burn, she began to run around it until the smoke "choked" her and she fell on it. She received burns so severe that for some time her life seemed in danger. This event occurred at Needles, California, during the first decade of this century. Both of the woman's parents were dead at that time. Sometime afterward this woman married again, and in due time died of syphilis. At this juncture the interpreter, an educated Mohave woman, said "She wanted to go with her husband—but all the same she married again later on. Why then get so excited?" This mildly satirical comment was probably due to the fact that interpreter is very happily married to a fine Mohave man, and, being herself only about 3/8 Mohave (the rest is partly White and partly Maricopa, a related though enemy tribe) rather anxious to maintain her status as a Mohave in a tribe hostile to mixed-bloods. On the other hand her comment also sounded somewhat puzzled. At any rate it was received rather unfavorably by informant. (Hiku:pk generally means syphilis, though certain late manifestations of gonorrhea are sometimes also called hiku:pk.)

3) Utu:ra, of the Tcatc gens, was a Mohave of about forty years. He tried to jump on the funeral pyre of his wife O:otc, of the O:otc gens, aged thirty. The wife had died of pneumonia. This event took place on the Needles cremation-grounds, at about 2:00 or 3:00 p. m., some thirty odd years ago. Utu:ra ran toward the pyre and fell down just beside it. His hair caught fire and had to be cut off. Later on he died of syphilis. (His gesture may not be ascribed to

parenchymatous neuro-syphilis, to which almost all Indians are immune.) (Interpreter commented rather tartly "Syphilis is just about all they die of over at Needles. Here at Parker (Arizona) they had no syphilis until the federal troops were stationed at La Paz several decades ago.") It should be added that the loss of his hair was not disappointing to the husband, since the clipping of hair was an important mourning rite, only once resorted to in another context.[11]

4) Tunayva-kor (English name not recalled by informant) of the Ñoltc gens, was the son of a Mohave father and Yuma mother. He had no education and was a common laborer who did odd jobs for a living. His mother had died during his adolescence. His father was Añañemam (called "Slim Jim") of the Ñoltc gens. At the time the events about to be described took place, the father was about 45 and the son about 25 years old. Slim Jim owned a very fast horse. His son took the horse and went to Samtcevut, a place near Needles, where some Mohave lived, to enter his horse in the races. His base of operations as a jockey seems to have been the Mohave settlement across the river from Needles. Slim Jim did not like this situation. "Perhaps he was proud of his horse." He left Parker and went to Needles after his son and the horse. For about a week Slim Jim lived in the home of his son's hosts and nagged the son continually about the horse. One day at last the son lost his patience. The horse was picketed near the house. The boy led the horse up to his father and said: "I thought you were my father and liked me as I like you. But you seem to care more for the horse than for me, and nag me all the time. The gun is in the house. I'll shoot myself. Here is your horse. You were after me all the time." The son went into the house, picked up a .32 revolver in front of all his relatives (who were his hosts), went to a shed near the house and shot himself in the heart. "He fell over dead then and there." His relatives picked up his body and "got mad" at Slim Jim, who was "all broken up" and cried. "You are the cause of all this," the family said. At his son's cremation the father

[11] Devereux, G., Primitive Psychiatry I. *Bulletin of the History of Medicine* 8:1194-1213, 1940.

tried to jump on the pyre, but, even though his relatives still blamed him, they restrained him. Years later they still blamed him for his son's death. These events occurred about fifteen years ago. Eventually Slim Jim returned to Parker, where he died some years later. " He smoked an awful lot and coughed a great deal." (This was a sly dig at the writer.) Asked whether the father dreamed about his son, informant replied " Even if he did dream of his son, he would not have told about it." Interpreter then said " It must be awful to have caused someone's death and then to go on living—on and on." (This comment itself is interesting, because interpreter's own half-brother was driven to suicide by their aunt, with whom interpreter was having troubles just then.)

The case of Slim Jim is very unusual in several respects.

1) The relationship between father and son is atypical. In at least one case a son committed suicide because his father urged him to desert a faithless wife. This was done, however, in the son's interest, though it did not fit the general Mohave rule of not interfering in quarrels between spouses, because spouses are likely to " sneak out at night afterwards, have intercourse and become reconciled, and then you have two enemies instead of one." [12] In Slim Jim's case, however, the father violated the most basic of all Mohave rules: generosity, and was guilty of the capital crime of Mohave ethics: stinginess. This situation, in turn, explains the atypical vindictiveness of the family toward the father, since they probably felt compelled to dissociate themselves from so " contemptible " an action, on the one hand, and on the other to side with public opinion. Such a breakdown of family loyalty is rare, and occurs only when a member of the family is guilty of witchcraft.[13] The family stood by and did nothing while the son committed suicide, following in this respect the " non-interference " pattern, but afterwards acted as agents of tribal sentiment. It might also be added that family quarrels about property were rare, and thoroughly disapproved of.

[12] Devereux, G., *Sexual Life of the Mohave Indians.* (Doctor's Thesis, University of California Library, Berkeley, California), 1935, *id.* Mohave Beliefs Concerning Twins. *American Anthropologist*, n. s. 43: 573-592, 1941.

[13] Devereux, G., L'Envoûtement chez les Indiens Mohave. *Journal de la Société des Americanistes de Paris*, n. s. 29: 405-412, 1937.

(Hence the bitterness of interpreter's comments, who had business-troubles with her aunt just then.)

A minor atypical point is that the trouble started over a horse. The Mohave are not enthusiastic horsemen, nor accomplished ones. They did not use horses in warfare, not considering it "sportsmanlike" and condemning tribes using horses in battle.

We might add that, according to information received from Professor A. M. Halpern of the University of Chicago, funeral suicide was rather frequent among the Yuma, and Slim Jim's wife was Yuman. The father who nagged his son about the latter's wife did not attempt funeral suicide.

It is hence plausible to suggest that Slim Jim's gesture was expiatory and involved also an attempt at self-justification, which is decidedly not an element in Mohave culture. Altogether Slim Jim's attempt at funeral suicide is atypical in almost every respect, and hence was psychologically a poor move. The family, thoroughly Mohave in outlook, did not respond to it, and continued to blame him. The fact that he was rescued from the funeral pyre was an automatic culturally standardized response on the part of those present, not a sign that the father's ill deed was forgiven.

The whole situation indicates that Slim Jim was a maladjusted person, out of tune with Mohave culture. The fact that he had an alien wife and his heavy smoking reinforce this impression.

The Place of Suicide in Mohave Culture

Mohave culture shows a great deal of preoccupation with suicide, both real and fictitious. Major types of suicide recognized by the Mohave are:

1. Suicide of foeti at birth, through assuming a transverse posture *in utero* and making delivery impossible. This type of suicide is resorted to intentionally by future (potential) shamans, and unintentionally by foeti who have been bewitched and thus induced to commit suicide.[14]
2. Twins "making themselves sick and dying" if slighted, or as a result of a quarrel between twins.[15]

[14] Devereux, G., L'Envoûtement, *op. cit.*

[15] Devereux, G., Twins, *op. cit.*

3. Sucklings "making themselves sick" on realizing that their mothers are once more pregnant.[16]
4. Symbolic suicide, by projecting the self into a horse, which is killed, or into a piece of land, which is alienated, when marrying a relative.[17]
5. Vicarious suicide of shamans, who provoke the relatives of those whom they bewitched into killing them.[18]
6. Genuine suicide by violent means (shooting, stabbing, hanging, geophagy, etc.).[19]
7. Funeral suicide.

On a somewhat different plane we have the lure of the dead, who attempt to induce the survivors to join them in the land of the dead. This is not an authentic form of suicide, according to the Mohave, and will be briefly considered below.

The Mohave tendency to commit suicide is superficially paradoxical, in view of their highly positive attitude toward their tribe and mode of life.[20] On closer analysis it is the predictable outcome of a basic ambivalence; the negative attitude may, under provocation, become quite as intense as was formerly the positive attitude. This point has been so well documented and interpreted in psychoanalysis as to stand in no need of further elaboration, except insofar as it is incumbent upon us to discover the dark side of Mohave culture and to analyze the precipitating factor responsible for the shift from an openly positive to an overtly negative attitude. These factors will be discussed further below.

Funeral Suicide and the Lure of the Dead

Stringent taboos on the name of the dead and on the preservation of their personal property, or of photographs, is paralleled by a great

[16] Devereux, G., Sexual Life, *op. cit.*

[17] Devereux, G., The Social and Cultural Implications of Incest Among the Mohave Indians. *Psychoanalytic Quarterly* 8: 510-533, 1939.

[18] Devereux, G., L'Envoûtement, *op. cit.*—Kroeber, A. L., Handbook of the Indians of California. *Bureau of American Ethnology, Bulletin* 78, 1925.

[19] Devereux, G., Mohave Suicide. (Typescript, Committee for the Study of Suicide, Inc. New York), 1936.

[20] Devereux, G., Mohave Culture and Personality. *Character and Personality* 8: 91-109, 1939.

deal of preoccupation with death and ghosts. The lure of the dead is a powerful one indeed for the Mohave, and manifests itself in many forms. Several factors are responsible for this situation.

1) First and most important of these is the fact that the Mohave do not believe in eternal life. When a person dies, his soul, at first, becomes a "dead soul." A few days later it becomes a ghost (ñeveδ i'·) and enters the land of the dead, there to repeat more or less its previous life. After a few more metamorphoses existence ceases altogether. Hence a person dying some time after the demise of a friend, relative or love-object, cannot catch up with them. If association beyond the grave, or rather beyond the funeral pyre, is desired, the deaths should not be more than a short lapse of time apart, unless, as will be reported below, one can interfere with the duration of post-mortem metamorphoses.[21]

2) The witch can, and does, interfere with the process of metamorphosis, by suspending the transition of his victims from "dead soul" to "ghost." He segregates these dead souls "in his place," their souls visiting him at night and, if of the suitable sex, having intercourse with him (or her). Eventually he will come to fear that another witch may kidnap his retinue of souls, and/or he will long for their constant presence. As a result he will taunt the relatives of his victims, by confessing to witchcraft, whereupon the witch is killed. It must be stated that a witch only kills those whom he loves, except when acting as a paid agent of someone who wishes to put a personal enemy out of the way.[22]

3) Hence funeral suicide, as well as the vicarious suicide of witches enables individuals longing for a dead love object, to exploit certain mythical features of Mohave eschatology, in order to continue an affectively meaningful association. The witch, in particular, takes advantage of a culturally predicated eddy in the stream of life, and prolongs a certain stage in post-mortem metamorphosis, until he is ready to depart from the ranks of the living. The average individual has no such powers, and his only alternative is funeral suicide.

[21] Devereux, G., Mohave Soul Concepts. *American Anthropologist*, n. s. 39: 417-422, 1937.

[22] Devereux, G., L'Envoûtement, *op. cit.*, *id.*; Primitive Psychiatry, *op. cit.*

4) In view of what I have written elsewhere [23] regarding the relative homogeneity in the distribution of a Mohave individual's libido, it may be objected that funeral suicide proves the existence of highly individualized and intense object-cathexes. This contradiction is altogether nonexistent. First of all the existence of isolated cases of intense object-cathexes is not denied, though it must be considered as atypical, as in the case of the Hiwa : Itck psychotic episodes.[24] The small number of Hiwa : Itck cases, and of suicides in general, and of funeral suicides in special, proves this assertion to be correct. In our discussion of cases of Hiwa : Itck, we have specifically stated that funeral suicide in the female is in some respects the psychological equivalent of Hiwa : Itck in the male. The difference between the two types of responses is partly due to the fact that funeral suicide is elicited by an obviously irreversible situation, while the irreversibility of the situation bringing about Hiwa : Itck, i. e. desertion of an old man by a young wife, is theoretically reversible, but culturally irreversible. I. e. the deserted husband may not interfere with the new set-up, nor show his affliction, while the deserted woman may go and fight with her rival, a privilege also granted the male transvestite.[25] A further factor is the general instability of human relations, due to the constant change in the personnel of Mohave families brought about by a lack of stability in marriages. As I have put it elsewhere: " While the attitude of the human emotional environment is constant, the content of the environment is not constant." [26] This creates certain psychic strains, which may come to a head even through the death or departure of an individual who previously was not an exclusive or even highly significant love-object as it is in the alleged " suicide " of the surviving twin (cf. above). In the concrete, it may result in funeral suicide among the Mohave, or in the self-scarification or self-mutilation orgies reported from certain other tribes. I have discussed the general theory under-

[23] Devereux, G., Mohave Culture, *op. cit., id.*; Incest, *op. cit.*
[24] Devereux, G., Primitive Psychiatry, *op. cit.*
[25] Devereux, G., Homosexuality, *op. cit.*
[26] Devereux, G., Mohave Culture, *op. cit.*

lying this situation elsewhere,[27] which absolves me from the need of reopening the discussion in this context. Last of all, the special techniques used by the dead to induce the living to join them in death is largely responsible for the lure of the dead for the survivor. Before discussing these techniques, the reader is reminded of the fact that funeral suicide is attempted only in connection with the death of an *actual* spouse or blood-relative, and never in connection with the death of a lover, mistress, friend, or affinal relative (in-law). Depending on their age at death, the dead have two techniques at their disposal.

a) The souls of those who die untattoed (i. e. in childhood) do not enter the land of the dead, but disappear in a gopher or rat-hole, unless they are twins, who do not enter into the picture in this context.[28] The dead souls of babies sometimes return to their mother's womb, causing ghost-pregnancies (pseudo-cyesis) by forming a body for themselves out of a blood-clot, though in normal cases the moulding of this blood-clot into human shape is the function of the paternal sperm.[29] This type of pseudo-pregnancy generally occurs when the woman is approaching menopause; an obvious diagnostic hint that we are dealing here with definite gynecological conditions, such as cysts, tumours, etc. The woman will begin to dream, and even daydream, about the past, and therapy consists, in part, in confessing (partly for diagnostic purposes) these dreams to the shaman. Normally the condition is fatal to the woman, and the ghost-foetus carries her away from the land of the living. It is interesting to note that a certain woman who conceived, after what she thought was her menopause, thought she had this dread disease, until she was declared pregnant by a shaman. Childbearing in Mohave society being of the utmost emotional significance for the woman,[30] so much so in fact that male transvestites even pretend to be pregnant,[31] it is obvious that such " ghost-pregnancies " are powerful psychic forces, which may possibly lead to psychic suicide. The genuineness of

[27] Devereux, G., Social Structure and the Economy of Affective Bonds. *Psychoanalytic Review* (In Press).

[28] Devereux, G., Mohave Soul, *op. cit.*, *id.*; Twins, *op. cit.*

[29] Devereux, G., Der Begriff, *op. cit.*

[30] Devereux, G., Mohave Culture, *op. cit.*

[31] Devereux, G., Homosexuality, *op. cit.*

psychic suicides, well known in connection with anthropological data,[32] has been demonstrated also for modern society.[33]

b) During the four days and four nights following the death of the body, the dead soul revisits its former haunts, and will be seen by the spouse (or spouses) and relatives in dream. Should dream-intercourse occur at this stage, no untoward effects will be observed. "Should one dream, however, of visiting or being visited by a ghost after the four days and nights have elapsed, it is assumed that either the living long for the dead or vice versa and that the dream represents a true soul-adventure. Such dreams cause illness and death. . . . Dreams of sexual relations (especially incestuous intercourse) with ghosts are more fatal than other dreams. Baths and fumigations with arrow-weed scare away the ghosts." It is not known whether the surviving twin has such dreams.

It is significant that both types of disease are called wéyla′ ·k ñeveδ i′· (the first word is a contraction of two, meaning: anus-pain, and the second word means ghost.)

The powerful appeal of pregnancy has already been referred to. A dream of incestuous intercourse is a considerable psychic force, since it combines the appeal of that which is forbidden (i. e. incest), and which is now performed under irresponsible conditions (i. e. in dream), with a great deal of anxiety. Furthermore, the occurrence of such dreams of incest (combined with necrophilia in this instance) is in itself a sign of improper and insufficient socialization, in the same sense that actual incest is.[34] In the case of the shaman-witch, as pointed out above, the impact of such dreams is made more complex and more powerful by the witch's awareness of being respon-

[32] Clements, F. E., Primitive Concepts of Disease. *University of California Publications in American Archaeology and Ethnology* 32: 185-252, 1932.—Rivers, W. H. R., The Primitive Conception of Death (*in*) *Psychology and Ethnology*, London, 1926. Dr. Géza Róheim informs me that during his fieldwork in Normanby Island a man was declared "dead"—though he was alive and healthy—and was buried. Similar cases of "If he isn't dead then he ought to be" are also reported from other parts of Melanesia.

[33] Brill, A. A., Psychic Suicide. *Journal of Nervous and Mental Diseases* 80: 63-64, 1934. Yawger, N. S. Emotions as the Cause of Rapid and Sudden Death. *Archives of Neurology and Psychiatry* 36: 875-879, 1936. Psychoanalysts have reported many other cases of this type.

[34] Devereux, G., Incest, *op. cit.*

sible for these deaths, the purposiveness of these relations, and the fear that some other witch may abduct these captive souls. Altogether the stage is set for psychic suicide, regardless of whether these dreams occur during the allegedly harmless initial four days or thereafter. Psychologically, in an already ill adjusted individual, ill adjusted, that is, because he or she *has* such dreams, the theological hair-line distinction between dead-soul and ghost is likely to be of no great motivating value.

In brief, the lure of the dead as such, combined with maladjustment, definite notions regarding the sequence of stages of metamorphosis, and with other factors enumerated above, is sufficient to set the stage for either psychic or funeral suicide. In the concrete, several cases of actual suicide by shooting have occurred, where the suicides were either brothers, or else men involved with one and the same woman.

Funeral Suicide and the General Cremation Pattern

Funeral suicide is extremely well articulated with the general cremation-pattern, involving the destruction of the dead person's property, as well as of his abode. (In the case of an untattoed child who has, as yet, not left the cradle, the cradle, not the house, is deemed to be its abode. The cradle is broken and thrown in the river, rather than into the flames, unless subsequent sterility is desired.[35]) The prospect of remaining without a roof induces many young couples to abandon the parental home and either build a home of their own or move in with younger relatives. In brief the severance of bonds with the earth is quite as consistently stressed in Mohave culture as is the discontinuity of assuming in childhood a final human status, i. e. the abandoning of the cradle by children, mentioned above, and marriage in twins.[36] If property is not destroyed, the dead will return to get it. Sometimes they even come back for more property, not their own, in the form of twins.[37] All property is piled on the funeral pyre with the corpse and cremated, the essence of objects so destroyed going to join their owner in the

[35] Devereux, G., Der Begriff, *op. cit.*
[36] Devereux, G., Twins, *op. cit.*
[37] Devereux, G., Twins, *op. cit.*

land of the dead. Otherwise generous Mohave even begin to hoard goods in their old age, in order to take staple necessities with them to the land of the dead. Kroeber states: "(The Mohave) . . . are careless of property and spend money freely. . . . Only the old women evince some disposition to hoard for their funeral. . . . The destroying of property with the dead is a subject of much concern to most Mohave and frequently discussed. . . . Old women with difficulty keep a horse alive on gathered mesquite in order that it may be killed and eaten at their funeral. . . . When a man has sung for his dying or dead son, he throws away and gives him—*chupilyk*—his songs. An old woman had saved some odds and ends of property for *chupilyk* for herself. When she sold them, she declared her intention of buying food, which would pass into her body and thus be destroyed with her. She was perhaps humorous in her remarks, but at the same time evidently explaining to her conscience." [88]

It is obvious that a wholesale destruction of dead persons' property, heretofore depended upon for use by the survivors, could not occur without some anxiously but ineffectually concealed regret. In July 1935 interpreter's father-in-law died. Both interpreter and her husband—and we might add: the writer as well—were greatly devoted to this fine old gentleman. (The writer happened to reach Parker unexpectedly on the day of the "cry" and, being considered more or less a member of the family, was immediately invited to attend the "cry.") The situation about to be described cannot be properly evaluated, unless we add that both interpreter and her husband are exceptionally fine and generous people, on whose good-naturedness and hard work many less desirable people count at all times. Shortly before the old gentleman's demise interpreter had made him a fine bead-belt. Bead-belts take many scores of hours to make and find a ready market at high prices. During the cry, which lasted several days and nights, interpreter's husband could be seen most of the time either playing with, examining regretfully, or else actually wearing his father's bead-belt. It is probable that, quite apart from the keep-sake value of the belt, the husband, in his own

[88] Kroeber, A. L., Handbook, *op. cit.*

gentle and quiet way, unconsciously rebelled against the destruction of a piece of property both beautiful and valuable.

If this man, almost foolishly generous, and even mildly ridiculed for his extreme good nature by his equally generous and kindly wife,[39] seemed somewhat reluctant to destroy at least one piece of property, it is easy to imagine that in most cases the cultural rule governing the cremation of property arouses a great deal of resentment. Hence we need not be surprised that the actual destruction of property is accompanied by a great deal of emotion, whipped to a frenzy by the eery sight of the pyre, and somewhat out of control due to protracted vigils and to grief. The situation often crystallizes in its actual opposite: on the one hand an unbridled frenzy of destruction, and on the other brazen and irreverent sexual conduct, including, at least once, an attempted rape, after a woman hurled improper taunts at a certain man. The frenzy of destruction is a very basic reflex, carefully reported even for apes. In this context it appears to give some satisfaction to those who actually hurl goods into the fire. Cases are on record in which the mourners and others present, not content with destroying the dead person's own property, begin to divest themselves of their own personal properties and cast them into the fire. Hall[40] reports that at the funeral of a Mohave chief the crowd actually went to town to buy more property, when nothing more was left to be destroyed. The very frenzy of this behavior indicates that it is an over-compensation for the culturally inhibited desire to preserve property. It may also explain the latent fear of, and resentment toward, the dead.

At any rate it is a suitable stage-setting for suicidal behavior. It has been amply shown that, in general, property is considered as part of a person's "integrity," in Pareto's sense.[41] Among the Mohave in particular, I have specifically shown that no person is "human" until he owns land. "Bird-persons" have managed to attain the status of persons (ipa:) but failed to become human, because they could not acquire land.[42]

[39] Devereux, G., Homosexuality, *op. cit.*

[40] Hall, S., The Burning of a Mojave Chief. *Out West* 18: 60-65, 1903.

[41] Pareto, V., *The Mind and Society.* New York (4 vols.), 1935.

[42] Devereux, G., Sexual Life, *op. cit.*—Kroeber, A. L., Halyekupa (Typescript Myth, Department of Anthropology, University of California).

Though land is not specifically destroyed at cremation, it is either left fallow, at least for a period of years, or else is outright alienated.[43] The projection of the self into property (particularly horses or land) in connection with "symbolic suicide," when marrying a relative,[44] has been discussed elsewhere. The question now arises: Whose "property" is really being destroyed, even when destruction is limited to the actual legal property of the deceased? In part, no doubt, the property of the dead. We must not forget, however, that while title to property is clearly vested in the deceased, the general Mohave pattern of borrowing, lending, or informally transferring the use or usufruct of objects is so deeply articulated with Mohave patterns of generosity [45] that in many respects the survivors feel deprived of a number of objects on which they previously relied for their survival or comfort, and which, through long-standing use, they have, if not legally then psychologically, come to consider as "theirs" . . . i. e. a part of their "selves." Hence, in some respects, the deceased is robbing them of their own. Quite as much as affection, this property is a bond between the dead and the living. When the mourners begin to destroy their own legal property, the gesture may be interpreted as a taunt to the dead, as much as a gesture of grief and piety. "You have taken so much from me, you might as well take the rest," they seem to say. This attitude is by no means without parallel in primitive society. When, in 1906, the Dutch, pretending to recover silver allegedly lost on a Chinese junk on Balinese shores, invaded that island, the king and his concubines marched toward the Dutch, into the fire of rifles, throwing handfuls of coin at them, shouting: "That is what you came for—now get it." Among the Moi of Indo-china, I have observed similar reactions. I sent a native friend of mine to buy me as many chickens as he could find. He returned with a large load, but paid more for them than they were worth. When I pointed this out to him, he became angry and rushed to his house, returning with a pig worth far more than the price difference under discussion, though I neither scolded him,

[43] Forde, D. C., Yuma Ethnography. *University of California Publications in American Archaeology and Ethnology* 28: 83-278, 1931.

[44] Devereux, G., Incest, *op. cit.*

[45] Devereux, G., Mohave Culture, *op. cit.*

nor asked for a refund. It is highly significant that the man in question was, through my adoption into the tribe, a close relative of mine, who furthermore depended, in part, on income derived from working for me.

The situation just described, together with an extreme cultural interference with the pursuit of economic goals [46] in general, and with hoarding in particular, makes it highly probable that, in committing funeral suicide, a person throws himself primarily after "his" property, rather than after the dead person. Obviously, in this context, the word "his" refers not to legal title, but to a psychological sense of ownership.

This view is greatly strengthened by other considerations. I have repeatedly pointed out [47] that the laxity of Mohave sex-behavior is compensatory in character—particularly as regards economic frustrations—and that it functions as a safety-valve. This safety-valve is denied to mourners, even though they are passing through a major economic crisis. Only dream-intercourse is permitted to the mourners. Should they resort to actual intercourse, it will result in sickness and other deleterious effects. A woman who has intercourse while mourning for her child will become barren. This barrenness can be cured by eating gopher-meat, though children conceived after this cure will have red and blinking eyes like gophers. (If we recall that children with untattoed chins enter gopher-holes when they die, and may cause pseudo-cyesis, it becomes quite obvious that intercourse is avoided in order to prevent this dreaded condition.) The fact that occasional outbursts of sex-behavior do occur at funerals suggests both the need for an emotional outlet, and that economic elements have been brought into play.

An additional consideration is the fact that, quite apart from legal material property, the individual himself is economically valuable to his kin, to whom he owes help and support. Hence the sense of economic loss must be broadened to include not merely property destroyed, but also the deceased himself. This extension of the concept of economic loss to death and funeral rites is fully validated by

[46] Devereux, G., Mohave Culture, *op. cit.*
[47] Devereux, G., Mohave Culture, *op. cit.*, *id.*; Twins, *op. cit.*

an analysis of Mohave cooperation and mutual help.[48] As a matter of fact I have shown elsewhere that stinginess, incest and witchcraft can be dealt with as a functional whole.[49]

I have so far adduced primarily indirect evidence regarding the survivors' economically motivated resentment toward the dead. I have done so because, ever since Malinowski's [50] astute use of indirect evidence from animal husbandry to prove the Trobriander's nescience of the nexus between intercourse and procreation, indirect evidence has in many respects been regarded as more convincing than direct statements by informants. We are now prepared to adduce direct evidence to clinch the argument.

The "secondary" Mohave twin pattern specifically indicates that the dead, unlike the well-socialized living, are considered to be economically interested, since they return, in the shape of twins, from the land of the dead, to obtain further wealth, which will be burnt with them when they die. It was specifically stated that the goods for which twins return to earth are not goods which belonged to them in their previous incarnation.[51] Just as twins come for material goods not theirs, so ghosts come for the souls of their relatives, whom they attempt to lure into the land of the dead, by means of intercourse or pseudo-cyesis.

One last argument may now be offered. According to the Mohave only women commit funeral suicide. In view of case-histories quoted above—and even if we disregard the aberrant case of Slim Jim—the statement is false. The fact that it was made, however, is highly significant. According even to Mohave women, the women of the tribe are more flighty than the men, who are the economic mainstay of their own family, as well as of their parents and even affinal relatives. Hence a Mohave widow loses more than the widower does, provided that "loss" is interpreted economically.

(The economic unreliability of women is responsible for the fact that parents prefer sons. Their unwillingness to keep house has

[48] Devereux, G., Mohave Culture, *op. cit., id.*; Incest, *op. cit.*

[49] Devereux, G., Incest, *op. cit., id.*; L'Envoûtement, *op. cit.*

[50] Malinowski, B., *The Sexual Life of Savages in North Western Melanesia* New York (2 vols.), 1929.

[51] Devereux, G., Twins, *op. cit.*

caused several mildly bi-sexual men to marry male transvestites, who take pride in domestic work.) [52]

A last factor to be mentioned is the Mohave temperament, which rejoices in unbridled emotional outbursts. Clipped hair is the outward sign of mourning, and the attempt to sacrifice the body as a whole, rather than merely a cherished part thereof (the Mohave of both sexes are proud of their fine long hair and tend it carefully), is merely an exaggeration of the basic pattern.

In brief, the attempt to jump on the funeral pyre has become *at least* an optional cultural trait. The fact that it is more than a rare alternative to other modes of mourning is manifest in the statement that those present at cremation always take precautions to prevent it. This preventive pattern is so well organized that no successful attempt has ever been reported. Whether or not the would-be suicides count upon being rescued in time is open to debate. Some of the cases cited above impress one as rather half-hearted attempts, while others seem genuine enough. Well-publicized attempts at suicide are not so rare in our society as to enable us to brand these public Mohave attempts as outright fakes. Last of all we must not forget that some mourners may be grieving so genuinely as to make death seem a relief from suffering. Nor can we disregard altogether some guilty-feelings, since these suicides are allegedly mostly women, and few Mohave women are good wives and housekeepers.

Summing up, we find that funeral suicide is not merely well articulated with culture but that, even though it is basically asocial, it has been transformed into a socially useful outlet of pent-up emotions in a crisis, since actual death is always prevented.

The psychic strain involved in the severance of bonds I have discussed elsewhere.[53] It is fully applicable to this situation.

Funeral Suicide and Public Opinion

Public opinion is more or less tolerant of these attempts. "One feels sorry for them—but all the same it is a crazy (yamom) thing

[52] Devereux, G., Homosexuality, *op. cit.*
[53] Devereux, G., Social Structure, *op. cit.*

to do" informants commented. Curiously enough, funeral suicides are not condoned in terms of that great Mohave alibi "temperamental compulsion," (i. e. "It was his nature, he could not help it"), which explains the misconduct of shamans and of certain other aberrant types, including certain other forms of suicide. On the other hand the Mohave seldom withholds sympathy from those who rebel against fate and the commonplace. Mohave sympathy is quick and generous and always ready to side with the oppressed and with the victim of strong emotions. Persons attempting funeral suicide are, as a rule, given the benefit of doubt due to those who find circumstances unbearable. The aforementioned ironical comment of interpreter—a rather fully acculturated woman—was rather badly received by the more conservatively Mohave informant.

It is highly characteristic of Mohave public sentiment in this matter that, while persons who have been unsuccessful in other types of suicidal attempts are mercilessly taunted and teased about their attempt and failure, nothing but sympathy and commiseration is given to those who have tried to commit funeral suicide and have failed. This indicates that their actions and motives—the latter analysed above—are well understood and shared by the tribe at large.

Funeral Suicide and Acculturation

As can be seen from the dates of the concrete cases reported, the custom is rapidly becoming obsolete, as are the affective patterns connected therewith. This is amply proven by the ironical remark of interpreter, who—though she tries hard to be a typical Mohave—no longer fully participates in the ancient affective outlook. Even wholesale destruction is gradually being interfered with. The Government does not lend money for Mohave housing, unless the debtors guarantee not to burn them down. Houses owned outright—excluding perhaps American-style frame-houses which are rare—are still destroyed, however. Last of all, the impact of American culture gradually tends to break down the old pattern of extreme generosity, and gradually emphasizes legal title to property, at the expense of the psychological sense of common usufruct. It must be emphasized, however, that the concept of legal title was never absent in

Mohave society, and that its "communism" was purely behavioral. This primitive distinction has been drawn with great clarity by Herskovits.[54]

Conclusions

No attempt has been made to analyse funeral suicide in terms of Freud's "Mourning and Melancholia," [55] though that essay is perhaps one of the most significant ever written by an analyst, because in another essay,[56] dealing with the general problem of the severing of effective bonds, we have already correlated it with the social structure.

The purpose of the present paper was to describe Mohave customs connected with funeral suicide, and to show that a number of essentially negative or anti-social patterns of behavior have been skilfully articulated into a whole, which is functional in Linton's sense, and whose role is that of a security-system in times of a crisis which brings to a head some of the major basic conflicts in Mohave society and culture.

[54] Herskovits, M. J., *Economic Life of Primitive Peoples.* New York, 1940.

[55] Freud, S., Mourning and Melancholia. *Collected Papers* 4: 152-170. London, 1925.

[56] Devereux, G., Social Structure, *op. cit.*

FRANCISCO XAVIER BALMIS AND THE INTRODUCTION OF VACCINATION TO LATIN AMERICA

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I

On November 30, 1803 Francisco Xavier Balmis sailed from Coruña, Spain for the purpose of carrying the newly discovered vaccination to the wide dominations of the Spanish Empire. Seldom, perhaps never, in the history of medicine has there embarked an expedition so grandly conceived, so well executed, so uniformly successful as that of Balmis. Certainly no new therapeutic procedure of similar magnitude has ever been made available by a single agency to such a wide segment of the world's population. By it the discovery of Jenner was made available to the populations of the West Indies, Mexico, Central America, much of South America, the Philippine Islands, the East Indies and China. Through this one act on the part of the corrupt and decadent government of Spain more lives probably were saved than were lost in all the battles of Napoleon. Yet this magnificent experiment in social welfare and public health has gone substantially unnoticed and unrecorded by both medical and political historians. In these days of darkness it may not be inappropriate to bring to the attention of physicians and their friends the work of an all but forgotten number of their profession and at the same time set forth certain new material pertaining to the introduction of vaccine into the Western Hemisphere.

II

A complete treatment of the Balmis expedition should include a detailed consideration of the Spanish background together with an account of the activities of the various subsidiary expeditions undertaken by subordinates and assistants. However, for various reasons, such a study appears inadvisable at present. In the first place the primary emphasis is placed on the development of vaccine therapy in Mexico. Hence, a survey of the European background is unneces-

sary, particularly in view of the large continental literature already in existence. Moreover, a detailed report of progress in South America and the Orient would extend the length of the present work beyond convenient limits and would involve much detail of an essentially repetitious character. A careful examination of the methods and results in one region is an adequate sample of what occurred throughout the Spanish Empire and adjacent territories. In the second place the central theme of the entire exposition should be the character and fortunes of the guiding spirit of the whole adventure, Balmis himself. The activities of his subordinates are of secondary interest. Finally there is available a greater body of documentary data for the province of New Spain than for any other portion of the Empire. In the National Archive in Mexico City is preserved a fairly complete file of the official correspondence dealing with the introduction of vaccination into Mexico. This includes not only the relations with the home government at Madrid but also the dealings of the Viceroy with the local communities, the budgetary difficulties encountered, the public response to the new treatment and a host of other details. Moreover, these documents enable one to trace the administration of the public health problem created by vaccination up to the end of the Colonial Period. For these reasons, therefore, this essay is concerned primarily with the introduction of vaccine into Mexico.[1]

III

During the summer of 1803 preparations for the expedition went actively forward. On July 28 Balmis [2] was notified of his appoint-

[1] The Balmis material in the National Archive (*Archivo General de la Nación*, herein referred to as *A. G. N.*) is contained in the general subdivision or *Ramo* known as *Epidemias*. Citations are made to this by number of volume, file (*expediente*) and folio. Certain other *ramos* in the National Archive contain material concerning smallpox, epidemics and treatment, notably *Protomedicato* and *Hospitales*. The Director of the Archive has in his possession indices of these two *ramos*, prepared by the present writer.

In addition to the documents in the national repository, considerable material is contained in local or municipal archives. Relatively few of these have been explored and much undiscovered data may be in existence. In particular should be mentioned the *Archivo Municipal* in the City of Puebla (*A. M. P.*) which is a prolific source of provincial medical information.

[2] Caballero to Balmis, *Epid.* XVII, *Exp.* 10: 1-4, July 28, 1803.

ment and acquainted with his duties. On July 29 a series of instructions was sent to Miguel Cayetano Soler, who seems to have had direct charge of the arrangements.[3] Finally, on September 1, the royal orders were transmitted to Viceroy Iturrigaray in Mexico City.[4] The thirtieth day of November saw the expedition set sail from the port of Coruña.

The plans involved three principal items: the administrative personnel, the mode of conservation of the vaccine, and the route to be followed. With respect to personnel, Balmis was named Director. His salary was set at 2,000 pesos annually to run from his departure from Madrid to the return of the expedition. Thereafter, until he secured a position appropriate to his standing he was to receive half pay, and in addition he was granted a subsidy of 200 doubloons wherewith to purchase an outfit. As principal lieutenants his majesty appointed the following four physicians: Don Joseph Salvani, Don Ramon Fernandez Ochoa, Don Manuel Julian Grajales, and Don Antonio Gutierrez y Robredo. Each of these was to be paid just one half that assigned to Balmis. As practical assistants there were named the surgeons Don Francisco Pastor and Don Rafael Lozana Perez, at 600 pesos each and as male nurses Don Basilio Bolaños, Don Angel Crespo and Don Pedro Ortega at 500 pesos. All these were to receive half pay after their return and until established, together with 50 doubloons for personal equipment. In order to care for the children the party included Doña Isabel de Cendala y Gomez, the former rectress of the Foundling House at La Coruña. She joined the others at this port and accompanied them on the entire trip. Concerning the training and character of these individuals we have no direct information but it may be assumed from the care with which the whole undertaking was organized that they were all considered persons of professional ability.

The problem of vaccine transport was serious. The voyage was certain to be of long duration, involving a minimum of several weeks

[3] Caballero to Soler, *Epid.* XVII, *Exp.* 8: 91-92. San Ildefonso, August 4, 1803.

[4] Royal Order, as transmitted from Caballero to the Viceroy of New Spain. *Epid.* X, *Exp.* 7: 1-8. San Ildefonso, September 1, 1803.

Since this document is the best, if not the only, official and authoritative statement of the purposes and organization of the expedition it has been translated and reproduced in full as Appendix I.

passage from the Canary Islands to the West Indies. Several rather different methods were in vogue at the time. The first was to prepare the virus by placing active matter from a pustule of a cow between two small plates of glass or otherwise sealing it in glass out of contact with the air. Another was to impregnate cloth, or silk threads with the virus and allow it to dry. Both these procedures suffered from lack of aseptic precautions and moreover the virus was very likely to deteriorate. Since these and similar devices were notoriously unreliable, it was determined to utilize another safer although much more cumbersome and expensive method. The latter consisted of transporting the vaccine fluid in human reservoirs. At the outset of the voyage a small, non-immune boy was to be vaccinated with a potent preparation of cow pox virus. At the point when the reaction was at its peak, matter was to be transferred from this individual to the arm of another boy who would preserve the active principle until it was transferred to the next. This chain vaccination was to be continued until the New World was reached, at which time any number of new patients would be available. The royal orders specified simply a " sufficient number " of children. The boys were to be selected from various orphan asylums, with permission of relatives if known, and were to be well cared for. They were to be retained in the colonies after arrival, and of course after their usefulness had ceased. Nevertheless they were to be given every consideration and were to be educated at the expense of the state until they were able to enter some regular employment. Actually twenty-two sailed from Spain. Unfortunately since their names were not recorded they must forever remain anonymous contributors to the cause of medical progress.

The route to be followed was carefully worked out in advance. On arrival in the West Indies the expedition was to split. The main party under Balmis was to proceed to Mexico City and introduce vaccination throughout the Viceroyalty of New Spain, subsequent to which it was to sail for the Philippines. The remainder of the group was to go to the region of the present Colombian Republic, then over the Andes to Ecuador and Peru and finally, by an undetermined route to the settlements on the Rio Plata in present Argentina and Uruguay. This itinerary was carried out in all essentials although in detail it was determined by local circumstances.

The first stop was at the Canary Islands where a public demonstration was organized by the Governor and where the first vaccinations were performed.[5] After what must have been a quick trip across the Atlantic the party reached Puerto Rico sometime in February, 1804. Here Balmis encountered for the first time a situation which baffled and irritated him more than once during the course of his journey. He found vaccine had already been introduced, in fact "established." It had been brought from the Island of St. Thomas [6] by an undisclosed agency but as soon as he began to examine the vaccinations he found them to be spurious because "they did not protect against the smallpox."

The events of March, April and May are obscure. From Puerto Rico Balmis evidently proceeded to the northern coast of South America, in conformity with instructions. According to the standard account [7] he made his third stop at Caracas in Venezuela. Here the party split. Balmis and several assistants went on to Havana. The remainder, under Assistant Director Don Francisco Salvani, started by ship for Peru presumably via Panama. Those who went with Salvania were Fernandez Ochoa, Grajales, Lozana Perez, Bolaños and Crespo.[8]

[5] Balmis to Perez, Puerto Rico, Feb. 28, 1804. *Epid.* IV, *Exp.* 10: 7.

[6] *Idem*, p. 7.

[7] *Gaceta de Madrid*, October 14, 1806. Here is the summarizing resumé of the entire expedition, published after the return of Balmis to Spain. It has formed the basis of most if not all the existing descriptions of the expedition, such as those in general histories of medicine. This was the document forwarded to Dr. Jenner in England and which brought him much pleasure (cf. John Baron, *Life of Edward Jenner*, London, 1838, vol. 2, p. 78).

[8] Balmis, *Statement*, Havana, June 10, 1804. *Epid.* X, *Exp.* 7: 48. The subsequent fate of this group deserves some mention although sufficient information is lacking to make possible an extended discussion. The only basic source material is the brief account in the *Gaceta de Madrid* for Balmis himself seems to have lost sight of his comrades after parting with them at La Guayra, the port for Caracas. Undoubtedly the local archives of Northwest South America would yield more data, but these archives have never been examined. It is possible, therefore, only to quote the *Gaceta* version:

"Of the section of the expedition dispatched to Peru it is known that it was shipwrecked in one of the entrances of the Magdelena River, but obtaining prompt aid from the natives, from the local authorities and the Governor of Cartagena, the Assistant Director (Salvani), his three assistants and the children, as well as the virus in properly mature condition, were saved. The fluid was disseminated

One further subdivision became necessary. The President of Guatemala had submitted a petition to the king, requesting that vaccine be conveyed to his province. In response, Balmis was obliged to detach another member of his already reduced corps of assistants and send the surgeon Don Francisco Pastor from Havana to Trujillo to fulfill the mission.[86]

The expedition arrived in Havana in early June. On the 8th of

in that port (Cartagena) and its province successfully and with good results. From there they sent it to Panama and, provided with all that was necessary, they proceeded on the long and arduous voyage up the Magdelena River. They stopped on both banks and then individually penetrated inland as far as the villages of Tenerife, Mompax, Ocaña, Socorro, San Gil and Medellin in the Cucuta Valley and the cities of Pamplova, Giron, Tunja, Velez and other towns of that populous region to fulfill their commission. They finally reunited in Santa Fé (Bogotá), having instructed practitioners at all points and leaving a considerable number of copies of the regulations, as prescribed by the Director, for the conservation of the vaccine. This they communicated, as stated by the Viceroy, to fifty thousand persons without a single unfortunate incident. During the latter part of March, 1805, they prepared to continue on their respective courses, each following a different route, and thus cover other cities of the Viceregal domain situated on the road to Popayan, Cuenca, and Quito with greater facility and dispatch, and thence to Lima. In August they were in Guayaquil."

Baron (*Life of Edward Jenner*, vol. 2, p. 81) adds that Salvani was everywhere received with great enthusiasm as far as Quito.

In view of the fact that the Royal Instructions contemplated a visit as far as the Argentine cities it is noteworthy that no trace exists at present of the Salvani party after their arrival in Ecuador. (This statement must always be predicated on the assumption that no documents exist in the capitols of South America or Seville which could throw light on the question.) There is some reason to believe that the group never progressed farther than the west coast of the continent, or at least that it never reached the Rio Plata. According to the account given by Eliseo Cantón (*Historia de la Medicina en el Rio de la Plata*, Madrid, 1928, vol. 1, p. 416 ff.) notification of the expedition's departure was acknowledged by the authorities in Buenos Aires with much satisfaction. However, it was pointed out that it would take years for the vaccine to arrive. In the meantime many persons would fall victims to smallpox. Consequently it was regarded as a dispensation of Providence when the Portuguese ship *La Rosa del Rio* put into Montevideo on July 5, 1805, with 38 negro slaves, three of whom had been vaccinated. (Why and where these slaves were vaccinated is not stated.) Taking advantage of this opportunity the medical profession soon established the method in Argentine provinces, thus rendering unnecessary the virus carried by Salvani's party. Since the latter is nowhere mentioned by Cantón it is safe to assume that the expedition never proceeded south of Ecuador and Peru.

[86] Balmis to Viceroy, Havana, June 10, 1804. *Epid.* X, *Exp.* 7: 46.

that month the Royal Patriotic Society [9] convened to consider the vaccination question. They informed themselves "in minute detail" of the matter, ordering two copies of the instructions to be placed in the library of the Society, and elected Balmis to an honorary membership. At the same time a central vaccination board was formed for the dissemination of the fluid among the inhabitants of the Island of Cuba. However, Balmis was anxious to continue his journey for he wrote the Viceroy [10] on June 10 that he intended to depart on or about June 17 for Yucatan whence he would proceed to Vera Cruz, arriving there toward the end of July. Since the original royal instructions directed the expedition to go directly to Vera Cruz from Havana, the decision to make a detour to Yucatan seems to have been reached by Balmis while on the voyage.[11] Whether any extraordinary motives prompted him to take this course is doubtful, but it may perhaps have been more than coincidence that when he arrived he found vaccine already introduced both on the peninsula and the region of Vera Cruz. This unauthorized endeavor to anticipate the expedition, and the resultant controversy, are enlightening in themselves as illustrating the type of obstacle encountered by those legally commissioned to disseminate the treatment. We have here, moreover, an example of the unfortunate consequences which follow upon the attempt by private interests to compete with a public health agency. Hence it becomes desirable to consider in detail material which otherwise might be regarded as hopelessly trivial.

IV

It is quite clear that vaccine was in the Caribbean colonies prior to the arrival of the Royal Expedition, although its ultimate origin is obscure. Two introductions seem to have occurred, probably independently, one in Vera Cruz, the other in Yucatan.

Late in March, Bernardo de Casas, physician of the Royal Navy,

[9] Duque de Heredia to Balmis, Havana, June 13, 1804. *Epid.* IV, *Exp.* 13: 1.

[10] See footnote no. 8.

[11] Balmis to Perez, Puerto Rico, Feb. 28, 1804. *Epid.* IV, *Exp.* 10: 7. In this letter Balmis offers to stop at Campeche and Merida "to extend this immense treasure to the fortunate inhabitants."

shipped some vaccine from Havana to Vera Cruz [13] on the frigates *Amphitrite* and *Nuestra Señora de la O*. It is not entirely apparent where Casas secured the virus although very probably he secured it from Doña Maria Bustamente who brought it from Puerto Rico.[14] This incident is discussed below in connection with events in Yucatan.

During the voyage and prior to arrival at Vera Cruz on April 1, 1804, the second officer of the *Nuestra Señora de la O* caused to be vaccinated two sailors, Manuel Sierra and Francisco Montero.[14] From the sailors the vaccine was communicated to several other persons, the operation being performed by Don Miguel Perez Carillo, surgeon of the ship.[15] He first vaccinated five children, then twelve more. The purpose was stated to be in order that the virus might not become vitiated. On April 24 further reserves were built up at the request of a practitioner, Dr. Don Francisco Hernandez by vaccinating six musicians attached to the local military units.[16] By the following day the Ayuntamiento was able to write the Viceroy [17] the municipal medical board's opinion that "the legitimate vaccine is established in this city." The introduction of vaccination in Vera Cruz must, therefore, be regarded as having been accomplished.[18]

[13] Viceroy to Ayuntamiento of Vera Cruz, Mexico, April 21, 1804. *Epid.* X, *Exp.* 10: 4.

[14] Perez, *Decree*, Merida, April 3, 1804, *Epid.* IV, *Exp.* 10: 2.

[14] Ayuntamiento of Vera Cruz to Viceroy, Vera Cruz, April 21, 1804. *Epid.* X, *Exp.* 10: 8-10. There may have been some question of preservation involved, since the Ayuntamiento report states that these vaccinations "succeeded in obviating a failure." This body also extended a vote of thanks to the men concerned and granted Sumarán 100 pesos and each of the sailors 50 pesos. Sumarán had secured the material impregnated on silk. The actual transfer to the sailors was performed by Carillo.

[15] Ayuntamiento to Viceroy, Vera Cruz, April 14, 1804. *Epid.* X, *Exp.* 10: 1-2.

[16] Garcia Dabila to Viceroy, Vera Cruz, April 24, 1804. *Epid* X, *Exp.* 10: 5.

[17] Ayuntamiento to Viceroy, Vera Cruz, April 25, 1804, *Epid.* X, *Exp.* 10: 12.

[18] The subsequent course of the treatment in Vera Cruz may be followed from the communications of the Ayuntamiento to the Viceroy. On April 23 the daughter of the captain of the port was vaccinated, a "laudable example of resignation and conformity." (*Epid.* X, *Exp.* 10: 17). By April 27, there had been 326 operations (*Epid.* X, *Exp.* 10: 23). By May 2 the number of persons with active cases had fallen to six and the governor issued a decree ordering every case of smallpox to be reported (*Epid.* X, *Exp.* 10: 29). Three days later only four cases were left (*Epid.* X, *Exp.* 10: 35). By May 19 all the old cases were recovered and there had

The zeal with which the city fathers of Vera Cruz propagated vaccination among their own citizens was surpassed only by the assiduity with which they undertook to spread it all over southern Mexico. Such pious fervor is understandable enough as far as the Vera Cruz townspeople were concerned, but why the Ayuntamiento should embark upon a small crusade is less comprehensible. From the obsequious tone of their correspondence with the Viceroy and their great care to bring every detail to the attention of that august personage, some ulterior motive might be suspected. Perhaps there was present a desire to find favor in the Viceroy's eyes together with a surreptitious joy in stealing the thunder of the great Royal Expedition. Perhaps, however, such ideas do injustice to the Ayuntamiento. They may have been moved only by the urge of enlightened charity.

Whatever the background within a few weeks after the arrival of Sumarán and his frigate, vaccine was on its way to the interior. On May 9 virus "in vials and in silk" was sent by mail to Oaxaca.[19] The gift was acknowledged on May 22 and a medical board set up to begin vaccination.[20] Unfortunately it was found that the virus had lost its potency.[21] Balmis was later obliged to send a representative with a fresh supply. Evidently the Vera Cruz physicians had not mastered the technique of preserving the fluid.

More fortunate was the attempt to send vaccine to nearer cities. After one abortive trial a vaccinated girl was sent to Jalapa.[22] Suc-

been only 9 new vaccinations. It was pointed out that extreme difficulty attended the finding of non-immune persons since nearly everyone had suffered from the disease, or had been vaccinated (*Epid.* X, *Exp.* 9: 4). On May 23, two new cases of virulent smallpox were discovered and the Ayuntamiento mourned that "now we are afflicted with misgivings that the pest in this vicinity is not extinguished as we had deluded ourselves into believing." (*Epid.* X, *Exp.* 9: 7). However, by June 16 no new cases had appeared and the provisional infirmary was abandoned. No subsequent cases were reported until December by which time apparently the vaccine had disappeared.

This running correspondence more or less agrees with a final summary sent by the Ayuntamiento to the Viceroy on September 12. It is there stated that the total vaccinations in Vera Cruz numbered 1350. Since 326 operations had been performed prior to April 27, and since vaccinations continued until June 20, this figure is probably correct.

[19] Ayuntamiento to Viceroy, Vera Cruz, May 19, 1804. *Epid.* 10, *Exp.* 9: 4.

[20] Ayuntamiento to Viceroy, Oaxaca, May 22, 1804. *Epid.* IV, *Exp.* 6: 1.

[21] Viceroy to Balmis, Mexico. September 6, 1804. *Epid.* IV, *Exp.* 6: 4.

[22] Ayuntamiento to Viceroy, Vera Cruz, June 9, 1804. *Epid.* X, *Exp.* 9: 15.

cessful transfers followed until by July 100 persons had been vaccinated.[23] The ranking staff member (*Practicante Mayor*) of the Royal Military Hospital was sent with four inoculated boys to Cordoba and Orizaba about the first of May. On his return, June 6, he had communicated the virus to 155 children in the former town and 40 in the latter.[24] But by far the most ambitious undertaking was the dispatch of a ship to Yucatan.

Early in the spring of 1804 the governor of Yucatan, Don Benito Perez y Valdelomar saw an opportunity to secure the new vaccine for his province. As related previously Doña Maria Bustamente had arrived in Havana on February 10, accompanied by her son and two negro servant girls, all of whom had been vaccinated in Puerto Rico. The governor of Havana had caused the virus from these children to be preserved in vials and had forwarded some to Vera Cruz on the *Nuestra Señora de la O*. Another vial he sent to Perez at Merida in Yucatan. The latter turned the material over to the army surgeon, Don Antonio Poveda, with instructions to propagate the treatment. On March 19 a small negro boy was vaccinated and evidently some others, although there is no mention of a specific number.[25] By early April, however, it was apparent that all hopes were doomed to disappointment. The virus had lost its potency and gave no results whatever.[26] The governor then commissioned three prominent physicians to " resort to every means to see if the original pus could be found in cows in the province, utilizing the basic knowledge contained in those physiological descriptions that we have been able to acquire." This was a slim chance, and Perez was prone to regard their only hope as being the expected arrival of the Balmis expedition. Meanwhile, he pointed out, smallpox was still continuing its ravages. Most providential, therefore, from his point of view was the arrival at Campeche about the tenth of May of the brigantine *Salta* which had sailed from Vera Cruz on the first of the month, bearing the surgeon Don Miguel José Monzón with several vaccinated boys.[27]

[23] Ayuntamiento to Viceroy, Jalapa, July, 1804. *Epid.* X, *Exp.* 7: 63.

[24] *Epid.* X, *Exp.* 10: 38, *Exp.* 9: 13.

[25] These events are set forth in the Decree of Gov. Perez, April 2, 1804. *Epid.* IV, *Exp.* 10: 2-18.

[26] Perez to Monzón, Merida, May 11, 1804. *Epid.* IV, *Exp.* 10: 1.

[27] Ceballos to Viceroy, Vera Cruz, May 1, 1804. *Epid.* X, *Exp.* 10: 32; May 2,

The reception of the Monzón party was most cordial. The governor ordered all officials to cooperate to the fullest extent and even went so far as to promise the financial support of the Royal Treasury, a matter in which he may well have exceeded his authority. In turn Monzón lost no time. Having scarcely landed at Campeche he began his work. Using vaccine he had brought from Vera Cruz in vials he inoculated 13 persons. This material, however, was ineffective in all cases,[28] an experience reminiscent of the useless Poveda vaccinations two months previously. Indeed, it is generally noteworthy that the *in vitro* methods of virus preservation were very unreliable. Perhaps the percentage of failures was no greater in Latin America at this epoch than elsewhere in the world, but on the other hand the heat and humidity of the tropics may have accentuated the inevitable tendency toward deterioration. The *in vivo* method was much more successful. On May 19 Monzón vaccinated 20 persons "from arm to arm," using the children he had brought with him.

The subsequent career of Monzón in Yucatan need not be set forth in detail.[29] He evidently was a conscientious and capable physician, devoted to his mission, and quite successful as a pioneer in vaccination. Indeed, he went so far as to borrow a cow from a country curate, Don Manuel Suarez. This animal he inoculated "with the fluid from a pustule of his niece Juana Suarez." Although there is no indication of a successful outcome to this experiment the attempt marks Monzón as a man of scientific interest and initiative, qualities not always to be found among the practitioners of colonial Mexico.[30] His primary task, that of vaccine distribution, he carried out with effectiveness and dispatch. According to his final report [31] he performed 55 series of vaccinations, involving a total of 1366 persons,

1804, *Epid.* X, *Exp.* 10:2; Ayuntamiento to Viceroy, Vera Cruz, May 2, 1804, *Epid.* X, *Exp.* 10: 26; Perez to Monzón, Merida, May 11, 1804, *Epid.* IV, *Exp.* 10: 1.

[28] Monzón to Perez, Campeche, May 22, 1804. *Epid.* IV, *Exp.* 10: 8.

[29] Monzón made a series of progress reports to Perez covering several weeks. His trials and tribulations, his experiences with an indifferent public, and jealous colleagues, would form an interesting chronicle, but would bring out no points new to students of public health.

[30] Monzón to Perez, Campeche, June 19, 1804. *Epid.* IV, *Exp.* 10: 13.

[31] Monzón, *Statement*, Campeche, July 25, 1804. *Epid.* IV, *Exp.* 10: 19.

most of which operations were attended by favorable results. Since this work was done in sixty days (May 10–July 10), and since he had no assistance of a competent nature, the record of more than 20 vaccinations daily is highly creditable. It was indeed unfortunate that this obscure but sincere practitioner through no fault of his own was forced into a humiliating controversy with Balmis himself.

It will be remembered that Balmis, having written the Viceroy of his intention to proceed to Vera Cruz set sail from Havana for the mainland in the middle of June. He also had notified Governor Perez to the same effect. The latter immediately wrote to Monzón in Campeche [82] directing him to submit a full report of all his activities to Balmis. Monzón acknowledged the letter and promised complete cooperation. On June 30, Perez again wrote Monzón.[83] Balmis had already arrived and the governor was about to turn over to him all the papers pertaining to vaccination in the province. Within the next three days Balmis reached Merida and conferred with the governor. As a result of this interview, the content of which Balmis evidently set forth in a written communication,[84] the governor informed Monzón that Balmis was highly dissatisfied with the Campeche vaccinations, regarding them as prejudicial to public health. Indeed, he deemed it necessary to send his assistant, Gutierrez, to that town for the purpose of instituting a formal investigation. Although without visible enthusiasm, the governor ordered Monzón to treat Gutierrez "with the consideration his privileged commission merits" and to facilitate the inquiry in every way. Monzón answered one week later [85] in very indignant vein. He pointed out that his vaccinations had been highly successful, that the vaccine he had used was potent by all known standards, that no secondary ill effects had been observed, and that every practitioner in the city—even every barber—was by now well acquainted with the method. Moreover, he caustically observed, if his vaccine was as worthless as Balmis stated, then why did the latter send four boys

[82] Perez to Monzón, Merida, June 16, 1804. *Epid.* IV, *Exp.* 10: 12.

[83] Perez to Monzón, Merida, June 30, 1804. *Epid.* IV, *Exp.* 10: 13.

[84] Perez to Monzón, Merida, July 3, 1804. *Epid.* IV, *Exp.* 10: 15. Perez quotes from a letter (*oficio*) "of this date" from Balmis. The actual document is not contained in the National Archive file.

[85] Monzón to Perez, Campeche, July 10, 1804. *Epid.* IV, *Exp.* 10: 15-16.

with Gutierrez to be inoculated with that very same vaccine, " since it is more logical that in case doubt existed, as is pretended . . . he would have utilized the fluid brought from Europe. . . ."

The issue of the investigation was clearly a personal vindication for Monzón. Gutierrez examined the vaccine and some of Monzón's cases before the Ayuntamiento of Campeche on July 9, and not only pronounced the treatment legitimate but proceeded to vaccinate his four boys.[86] Following this favorable outcome, the Ayuntamiento requested Monzón to continue his work and voted him a formal expression of thanks and confidence. Monzón, however, discontinued active vaccination and soon afterward returned to Vera Cruz.[87] He either accompanied Balmis on this trip or immediately preceded him, for Balmis reached Vera Cruz on July 24.

His arrival was the signal for another rather acrimonious controversy. It being necessary to transmit the vaccine in order to ensure its propagation, he attempted to find persons in Vera Cruz who might be vaccinated. To his great chagrin he was unsuccessful. As he described[88] the situation to the Viceroy: " Since the pustules brought with me were in perfect state for their fluid to be employed, I endeavored to obtain persons into whom to inject it so as to ensure its propagation but all the efforts and assiduity on the part of the two councilmen (*Regidores*) and other zealous professional men proved futile. Observing the impending danger of losing a treasure that I have conserved at the cost of great labor and affliction, I imparted the extremely critical situation to the governor, who, appreciating the seriousness of the matter furnished ten individuals of the Garrison Regiment, and I have just finished vaccinating them."

Subsequently—long after Balmis had departed from Vera Cruz—the Viceroy wrote the City Government demanding an explanation.[89] He stated that he was " not able to reconcile this information with

[86] Monzón to Perez, Campeche, July 17, 1804. *Epid.* IV, *Exp.* 10: 17; also Gonzalez to Viceroy, Vera Cruz, September 12, 1804, *Epid.* X, *Exp.* 11: 3-11.

[87] After his return to Vera Cruz, the Ayuntamiento of that city on August 3 (*Epid.* IV, *Exp.* 10: 31-32) voted a resolution of thanks to Monzón and transmitted a copy to the Viceroy.

[88] Balmis to Viceroy, Vera Cruz, July 25, 1804. *Epid.* X, *Exp.* 7: 70.

[89] Viceroy to Ayuntamiento, Mexico, August 29, 1804. *Epid.* X, *Exp.* 11: 1.

repeated assurances given by the governor that the fluid brought by the frigates '*O*' and '*Amphitrite*' was being accepted and successfully propagated without ever indicating any resistance on the part of the populace."

To this demand the city replied in a very vituperative missive in which certain charges were brought against the conduct of Balmis.[40] The City Council first claimed that it had been impossible to secure unvaccinated persons because every non-immune individual had previously been immunized by the local authorities, or had been a victim of the disease itself. Consequently an accusation of indifference on the part of the citizens was no less than a calumny and the necessity for making an explanation was humiliating in the extreme. The document then goes on to point with pride to the noble and fruitful efforts of the city itself, as a result of which no less than 3,027 persons had been vaccinated in various towns " before the arrival of the expedition. This appears to have incurred the displeasure of Don Francisco Xavier Balmis, obliging him to manifest it openly." Finally the heart of the matter was reached when the Ayuntamiento came to the treatment accorded Monzón in Campeche. A terrible insult had been given the city when Gutierrez was sent to examine Monzón's vaccine. Gutierrez had actually stolen this vaccine—through the four boys he brought with him. Balmis had been offensive to Monzón personally and had maltreated the children sent with Monzón as carriers. And so on for several pages in like tenor the diatribe continued.

This entire episode might be regarded as too trivial for serious consideration did it not possess significance as an illustration of the difficulties attending even great undertakings. But for the timely intervention of the Governor of Vera Cruz, the vaccine might have been lost and the entire scheme might have failed in its object. It is quite clear that the fault lay on both sides. When the vaccinated sailors arrived in Vera Cruz, the Ayuntamiento of that city, knowing of the royal expedition, doubtless saw an opportunity to anticipate Balmis and achieve publicity and merit in the eyes of the Viceroy.

[40] Gonzalez to Viceroy, Vera Cruz, September 12, 1804. *Epid.* X, *Exp.* 10: 3-11.

It is rather too much of a presumption upon the charitable instincts of an ambitious body of municipal politicians to imagine that from motives of pure human kindness they would go to such lengths to disseminate a new medical treatment of which they probably had never before heard. Conceivably they might have been interested in advancing the progress of public health within their own jurisdiction. But that they would, at considerable expense and for such reasons, send missions to other towns and actually fit out their own expedition to Yucatan, passes the bounds of credibility. In support of this point of view may be noted the obsequious care with which they notified the viceroy of their every action and on the other hand the carelessness with which they permitted the smallpox virus to disappear from their own town as soon as it had served its purpose. Entirely in line with such policy was the rude treatment they accorded Balmis and their utter indifference to the welfare of the king's expedition.

At the other end of the controversy the behavior of Balmis was, to say the least, undiplomatic. Instead of being in any way gratified that the great humanitarian object of his visit was being accomplished by private individuals in advance of his arrival he obviously became subject to strong irritation. Judging by his actions in Yucatan, and his letters from Vera Cruz he regarded any efforts by others toward introduction of vaccine as a personal affront and a presumption upon his own prerogatives as the king's emissary. In short, all parties concerned behaved as if the propagation of vaccine in the interest of the public welfare were wholly secondary to considerations of personal aggrandizement and royal or viceregal favor.

Tarrying only a few days in the inhospitable atmosphere of Vera Cruz, Balmis, Gutierrez and 22 boys departed on July 28 for Mexico. Passing by the old road through Jalapa and Perote, the group arrived at the suburb of Guadelupe on August 8.

V

With his arrival at the central scene of his activities, Mexico City, a number of pressing problems confronted the Director of the

Royal Vaccination Expedition. These included first, and most important, the dissemination of vaccine together with propaganda through New Spain. In conjunction with this task, since he needed to overcome official and popular resistance, he found it necessary to go himself or send assistants to all the principal provincial cities. Secondarily he was under obligation to provide a home for the children carried from Spain and to make arrangements for his own transportation to the Philippines. Finally, in order to ensure the permanency of his work he had to organize the local authorities in such a way that they could continue vaccinations effectively after his departure.

Soon after he was settled in Mexico City, Balmis concerned himself with the children whom he had brought from Spain,[41] since it was expressly stipulated in the royal orders that they should be given the best of care and opportunity. After conference with the Viceroy, Balmis turned the children over to Cosmé de Mier, who was in charge of such matters. The latter, with the consent of all parties, then placed the boys in the general orphan asylum (*Hospicio Real*), furnishing them with everything necessary,[42] including "decent and separate rooms in the new building, not yet occupied." This building had just been constructed with funds derived from a bequest by a certain Captain Francisco Zuñiga. Evidently a serious attempt was

[41] An illuminating sidelight is thrown on the personality of Balmis by the controversy in which he indulged with the viceroy over his place of residence in Mexico City. According to royal orders the latter had assigned a house to the Director. This house Balmis occupied on the ninth of August. At the request of the Viceroy the tax assessor, Cosmé de Mier, sent an administrator and a notary to see Balmis and take an inventory (Mier to Viceroy, August 14, 1804, *Epid.* X, *Esp.* 13: 3). Balmis stated to these individuals that the house was uncomfortable and too far from the center of the city; in fact it was not "decent." (Viceroy to Mier, October 26, 1804, *Epid.* X, *Exp.* 13: 15). In order to placate the irate Balmis and give him no cause for complaint, he was ceded a better residence, on Calle de Echevarria which had been prepared for a member of the nobility, the Marquisa de Sierra Nevada. One reads between the lines of much of the Balmis correspondence that he was exceedingly jealous of his position as head of the king's expedition and very touchy on the point of social prerogative.

[42] Viceroy to Mier, Mexico, August 12, 1804, *Epid.* X, *Exp.* 13: 2; Mier to Viceroy, August 14, *idem*, 3-6.

made to make the boys comfortable, for by October 17, the sum of 209 pesos had already been expended for their subsistence.

Although Balmis had completely fulfilled his personal duty in thus delivering the boys to the viceregal government and had no further concern with their welfare, the administration was by no means finished with the matter.[43] In early 1805, the Viceroy learned that the Ministers of the General Treasury had settled on 120 pesos a month as a sum adequate to the support of 20 boys. He himself, however, felt that such an amount would involve an economy incompatible with their proper care and education, and reiterated a demand that everything possible be done for their benefit. In response Mier ordered an investigation by the administrator Juan Antonio de Aranjo. The latter's report was anything but complimentary to the government. There were 20 children of whom 6 were four years old, 2 were six, 3 were seven, 5 were eight, 2 were nine and 2 were ten. Five were designated as being assiduous in learning their letters, the rest were stupid. All were being instructed in Christian Doctrine of which they were so ignorant on arrival that they did not know the Sign of the Cross. Their behavior was very bad and considerable effort was necessary to break them of the profanity learned from the sailors on the voyage. In view of this information, Mier concurred with the Viceroy that something should be done. Nevertheless, since there is no further record of the case, it must be assumed that the children grew up as best they might in the tender environment of a state foundling asylum.[44]

[43] Correspondence on the *niños* includes the following letters: Balmis to Viceroy, Mexico, October 22, 1804, *Epid.* X, *Exp.* 13: 25; Viceroy to Balmis, November 5, *idem*, 29; Viceroy to Mier, February 26, 1805, *idem*, 31; Aranjo to Mier, March 4, *idem*, 36; Mier to Viceroy, March 16, *idem*, 39.

[44] Lest too much sentiment be expended over the undeserved fate of these boys, it must be remembered that they had been taken from a similar institution in Spain in the first place. Very likely their lot would have been as severe had they never gone to Mexico.

One final attempt was made to better their condition. In his letter of December 28, 1806 from Madrid to Gutierrez, Balmis wrote (*Epid.* XVII, *Exp.* 8: 95-99) "The King has issued strict orders to the Archbishop and the *Audiencia* of Mexico that they assume charge of the innocent youths who served the expedition as vaccine

Other difficulties arose subsequently in connection with not only the securing but also the care and restoration of small children. Indeed, as we look at it now, a more cumbersome and unsatisfactory system could scarcely be devised for the propagation of vaccine. Not only were the children subject to discomfort and neglect, but the very preservation of the virus depended upon a very uncertain succession of such children. More modern methods involving the use of animals and aseptic preservation *in vitro* have fortunately obviated the necessity of human reservoirs. The child carriers are all but forgotten, but their humble if wholly unrewarded efforts deserve a place in human recollection.

(*To be continued*)

carriers; that they be attended and cared for as they merit and be removed from the asylum where that indifferent viceroy placed them." But if any such attempt was actually made there is no documentary evidence at hand to prove it.

TEXTS AND DOCUMENTS

A CIVIL ORDINANCE OF THE YEAR 1846 TO COMBAT PHOSPHORUS NECROSIS

CURT PROSKAUER
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In 1700 almost exactly two hundred and fifty years ago Bernardino Ramazzini heralded the birth of *modern industrial hygiene* [1] with his work *De Morbis Artificum Diatriba* [Diseases of Workers].[2] Among the diseases afflicting artisans and laborers in various trades one would look in vain for a description of *Phosphorus Necrosis*, the dread symptom of the chronic intoxication found in workers exposed to the fumes of phosphorus. This lack is due not to an oversight on the part of Ramazzini, but to the simple fact that the disease did not exist in his lifetime.

Phosphorus had just been accidentally discovered in the urine and one hundred years were yet to pass before one realized that it could be obtained both more easily and plentifully from animal bones. Only by the beginning of the second quarter of the nineteenth century had progress advanced sufficiently to make phosphorus available for

[1] As early as 1473 the Augsburg prebendary physician Ulrich Ellenbog composed the treatise: "Von den gifftigen Besen Tempffen / vñ Reüchen, der Metal, als Silber, Queck- / silber Bley vnd anders So die Edlen handt / werck des Metal, als Silber, Queck- / silber Bley vnd anders So die Edlen handt / werck des Goltschmidens, vnd ander arbai- / ter in des feür sich gebrauchen müssen. Wie sie/sich da mit halten vnd die gift vertreibē sollē. /" [On the poisonous wicked fumes and smokes.] This little tract later printed, consisting of eight pages, is here to be specially cited because of its mention of "poisonous fumes." It also plays an important role in the history of industrial hygiene as it may be regarded as the first noteworthy industrial hygienic publication of world literature. A facsimile brought out by Koelsch and Zoepfl appeared as separate issue No. 2 in the series of Munich publications, Munich 1927. Henry E. Sigerist, "Historical Background of Industrial and Occupational Diseases" in *Bulletin of the New York Academy of Medicine*, Nov. 1936, second series, vol. XII, no. 11, pp. 597-609 indicates other important works in the field of industrial diseases.

[2] De Morbis Artificum Bernardini Ramazzini Diatriba. Diseases of Workers. The Latin text of 1713 Revised, with translation and notes. By Wilmer Cave Wright. Chicago Ill. 1940 (The History of Medicine Series issued under the auspices of the Library of the New York Academy of Medicine. Vol. 7).

industrial purposes: the manufacture of the newly discovered phosphorus matches, the so-called lucifers.

The manufacture of these matches proceeded at the time in a simple fashion without any mechanical assistance.[3] The procedure was conducted in small rooms which happened to be at hand. The end of the small piece of wood was first dipped into melted sulphur or paraffin, or according to the technical expression "soaked," followed by a dipping into a syrupy phosphorus mixture, the ignition compound proper. Drying, counting and packaging completed the simple manufacturing process. As the production of matches was relatively simple and filled an actual public need, their manufacture quickly developed from the end of the third decade of the past century in all the different European countries. This became an especially important branch of industry flourishing everywhere and attained particular importance in England, Vienna, Darmstadt and Nuremberg.[4]

It was with this new trade that chronic phosphorus poisoning began, the phosphorus necrosis, whose frightful symptoms were a bewildering puzzle. The disease was something entirely new, never having manifested itself before, a fact which in the history of nosology is a rare occurrence indeed.

The establishment of the match factories brought still another symptom, from the humane point of view no less dreadful, but which from the social and medical historical aspect was to be of the greatest significance for the future, as it provided the impetus for *industrial legislation* and in itself proved to be the very point of departure.

The possibility of employing unskilled labor at the simple work of match manufacture and the temptation to reduce production costs

[3] An exact description of the contemporary manufacture with all details is to be found in the following work which appeared at Erlangen in 1847: "Die Krankheiten der Arbeiter in den Phosphorzündholzfabriken, insbesondere das Leiden der Kieferknochen durch Phosphordämpfe. Vom chemisch-physiologischen, medicinisch-chirurgischen und medicinisch-polizeylichen Standpunkt bearbeitet von Dr. Freiherrn Ernst v. Bibra und Dr. Lor. Geist, pp. 307-310.

[4] Klinckstroem, Carl Graf v.: Das Hundertjahres-Jubiläum des Zündholzes. In *Forschungen und Fortschritte.* 8. Jahrg. (1932), pp. 402-403. Martell, Paul: Zur Geschichte des Zündholzes. In *Forschungen und Fortschritte.* 7. Jahrg. (1931) No. 27, pp. 365-366.

to a minimum induced English employers to engage along with men and women for the manufacture of the matches children who had scarcely attained school age. This abuse aroused such indignation everywhere that the authorities were forced to establish a "Children Employment Commission." The investigations of the Commission brought out that match manufacturers employed boys of the ages of five to seven years for work that exposed the bones of their faces without protection to the horribly disfiguring fumes of phosphorus.[5]

These fearful conditions brought the various governmental machines into play and introduced measures in two directions: *social* and *sanitary* ordinances. Statutory laws were directed against the social abuses of woman and child labor and assured definite protection against exploitation and premature child labor. A survey ordered by the authorities into the working methods of the match manufacture was to reveal the extent of the damage to the worker's health and the effect of the materials used upon the individual organism in order that a definite law be established to prevent such injuries.

Unfortunately however a period of twelve years had so elapsed between the erection of the first match factories in Germany and Austria around 1833 and the adoption of the first legal measures for the prevention of the influence of phosphorus fumes.[6] This delay is not to be attributed to the indifference of the civil authorities but rather to the failure of medicine to correlate the disease with the respective occupation of the afflicted. The association between the two could only be established definitely as cases with like symptoms increased, appeared for observation in different localities and were described in current scientific literature. Only as the examinations and observations of such sick patients revealed within the course of the year that the necrosis of the jawbone manifested itself

[5] Müller, P. Th. and Prausnitz, W.: Geschichte der Hygiene und Bakteriologie. in Puschmann: Handbuch der Geschichte der Medizin. Jena 1905, Vol. III, pp. 786 and 802.

[6] "The first American case of Phosphorus necrosis (in England phossy jaw), was reported in 1851, about fifteen years after the *first patent for the manufacture of lucifer matches was granted to a man in Springfield, Mass. in 1836.*" Alice Hamilton: Industrial Poisons in the United States. New York 1925, p. 308.

only in the case of workers, especially female workers occupied at the manufacture of phosphorus matches, had the point been reached where further research could be made into the particular cause of this strange malady.

Concurrently observed cases in Vienna and Nuremberg offered the hypothesis that the phosphorus *mass* itself did not cause these new pathological symptoms but rather that this hitherto unknown illness was caused by the *emanations of the fumes* developing during the manufacture of the phosphorus matches. Further observations of workers of different match factories in Prussia, Wurttemberg and France proved this assumption.

Nothing now was to hinder the fight against the new enemy of the working class. The problem could now be solved.

After Lorinser, chief surgeon of the district hospital of the suburb Wieden, near Vienna, first recognized phosphorus fumes as the immediate cause of phossy jaw and published his observations and conclusions in a historically memorable work of twenty-three pages [7] other scientists, physicians, chemists and pharmacists contributed their observations.[8] All papers and discussions at The Twenty-Third Congress of Natural Science at Nuremberg were devoted to the topic of the phossy jaw and its prevention.

Publicity had been created and reached a point where the provincial government for Lower Austria—prodded no doubt by Lorinser's public statements—issued an ordinance, dated October 7, 1846, which was directed against the prevailing carelessness " during the drying of the matches when there is a free and unhindered circulation of phosphorus fumes in the work rooms without preventitive measure." The regulation ordered adoption of precautionary measures, which had already been noted in the briefer court decrees of June 19, 1843, July 8, 1844 and September 3, 1846. The aforementioned ordinance No. 53330 drawn up in the form of a circular letter to the respective factory owners had been copied from the hand-written original on six folio pages of hand-made paper by the then current method of lithography. It is of historical and especially medical

[7] *Medicinische Jahrbücher des K. K. österreichischen Staates.* März 1845, pp. 257-280.

[8] Bibra and Geist: Die Krankheiten der Arbeiter . . . pp. 100-102.

historical interest not only because of its significance for early industrial sanitation, but even more so because it represents the first notable step of government authorities anywhere in combating the disastrous effects of the manufacture of phosphorus matches. The lucidity of its contents little resembles the customary stilted governmental form. The clear description of the symptoms of phossy jaw, its causes and consequences, the conditions prevailing in the match factories and the measures suggested and offered in the ordinance itself combine to form a decree which can be hardly superseded for its precision and validity. The manner in which this dread subject was attacked concurrently from the humane and scientific points of view is worthy of a country which had been bequeathed a legacy of a first rate medical organizer and hygienic thinker. Johann Peter Frank, dead at the time nearly twenty-five years, had reformed not only the sanitation system of his chosen country, Austria, but through his activity had influenced the public welfare of all other civilized countries.[9] The period of the birth of the "Vienna Match" and the foregoing ordinance is the era so pertinently described by Sigerist:[10] "Frank's death took place six years after the Congress of Vienna. The restoration had occurred throughout Europe. In the domain of hygiene this took the form of a gloomy reaction. The tide of public health, which had been in full flood during the Enlightenment, had ebbed. The State had lost its absolutist power. The bourgeoisie was growing rich, and had no interest in the public welfare. Beneath the surface, however, the seeds of a new revolution were germinating —the industrial revolution. *Fresh dangers threatened the health of the population. Unforeseen problems were emerging and were demanding active solutions. Towards the middle of the nineteenth century, a new hygienic movement began.* Experts looked back to the work of Frank, whose treatise was an imposing monument handed down from the eighteenth century."

It is significant that these regulations were promulgated in Vienna, where Frank's influence was still felt long after his death. A document such as this, which stands as a milestone in the history of industrial hygiene, pathology and stomatology, bears rereading.

[9] Johann Peter Frank (1745-1821). Author of the "System einer vollständigen medicinischen Polizey."

[10] Sigerist, Henry E.: Grosse Ärzte. München 1932, p. 189.

Translated it runs as follows:

No. 53330

By the Imperial Royal Provincial Government of Lower Austria.

It has been brought to the government's attention that repeatedly within the course of two years girls from the age of 18 to 30 have been treated medically for necrotic destruction of the jawbone. These cases have shown a striking similarity in the course of the entire illness.

Because of the rapidity with which this evil has progressed despite all help and because of its repeated manifestations, one has observed through an exact investigation that all girls afflicted with this dreadful malady customarily ending with death have been workers from the match factories where the so-called lucifer and phosphorus matches are made and where the work rooms are constantly impregnated with phosphorus fumes. Supported by these facts it may be concluded that the necrosis of the jawbone has been caused by the lengthy influence of the phosphorus fumes in the respective factories, especially when it is considered that the amount of phosphorus contained in the phosphorus matches is not small and that the drying of the matches takes place in winter at rather a high temperature.

An ordered investigation has shown that in the factories of Vienna and the neighborhood, where such influences prevail which create such an entirely peculiar suffering, the following is to be found true. If there be a slow even process of phosphorus poisoning at its very lowest stage the human health is considerably altered but in the severer cases, where the necrosis of the jawbone itself must be observed, not only is the general health altogether undermined but very often life itself is destroyed. Therefore it appears to be pressingly urgent at least to reduce to the utmost the principal evil of the injurious influences of the phosphorus upon the health of the worker in the match factories. The outstanding evil obviously exists in the carelessness with which one permits the developing phosphorus fumes to escape free and unhindered in the work rooms during the drying of the matches. In order that this disturbance may be met effectively and that the injurious influence of the phosphorus fumes upon the worker also be arrested and to prevent all that now is to be found objectionable from the sanitary point of view in the present manufacture of matches the government finds itself in conformity regarding the high court decree dated of the third of the past month no. 27977/1609 with reference to that dated of 19 June 1843 no. 18096/1666 and that dated of 8 July of the past year no. 36103 in reference to the manufacture of friction matches, the issued court decree orders the following:

1. The drying of phosphorus matches is to take place at a temperature over 18 degrees R.[éaumur] only in well erected drying stands with observance of the appropriate care.

2. These drying stands must be set apart and isolated that is placed in such localities which do not come into contact with other working-rooms or with other buildings. These stands must close fully airtight; they should be able to heat from below or from without through the means of warmed air and are to be provided with effective draughts or ventilators. These are to be kept altogether or partly closed during the drying operations but are to be opened only so long and set into action after the completed drying of the matches until all the phosphorus fumes in the drying stands have been again dispelled. Only then is it to be permitted that the drying stands themselves be opened and the finished matches be taken out.

3. The drying of the matches is to be regulated in the manner that first and at definite hours the matches which have been dipped into the phosphorus mass are to be laid into the drying stands, that hereupon only after the stands have been closed is the warmed air permitted to enter and that those matches already dried are not allowed to be removed earlier until the circulation of the warmed air has been stopped through the closing of the conduit pipe, until those phosphorus fumes which have assembled in the stands have been altogether dispelled with the help of the ventilator toward the outside.

4. It is by no means to be permitted that the drying stands be now opened at any time whatsoever, now soon closed again, in order to insert a part of the matches, then to take out another batch, without having shut off the heating earlier, to have dispelled again the assembled phosphorus fumes.

5. Where drying sheds are to be used instead of drying stands for the drying of the matches, the former are to be secluded from the working localities and so erected that before a new batch of matches is inserted that the collected phosphorus fumes in the drying shed can be dispelled in the open air by means of appropriate outlets of escape.

6. For work at the drying localities be they the drying stands or the drying sheds, just as for the preparation of the composition, strong men are to be employed who moreover are to be changed during the day.

7. The preparation of the phosphorus composition and that of the chlorine are to be done in a separate locality and moreover at best in the very same kitchen where the necessary sulphur is melted for the first dipping of the matches.

8. The dipping of the matches already sulphurized in the composition is to take place in this kitchen.

9. This kitchen must be provided with a flue that draws well and can be kept constantly open. On the other hand all entrances and exists must have doors which can be locked and be permanently closed even though they be not shut. The purpose of such is that should the sulphur or phosphorus composition at one time ignite or the chlorine matter detonate, the other

working localities would escape the highly dangerous fumes developing therefrom.

10. No localities are to be used as working rooms which are at least not eleven feet high and provided with a well constructed ventilator so that the admission openings are arranged in a suitable corner below on the floor, the escape openings however on the opposite wall and corner and moreover on the roof or at least at the uppermost part of the window that the existing ventilator be led above the worker.

11. There is to be an area of four feet square for every worker that he can during the course of work change his position.

12. Regarding necessary cleanliness the factory owner is responsible for storing the outer-clothes of the workers male and female as he must also give them a heated room in the winter for changing their outer garments where no work may be conducted. Here the workers can take off their over-cloths which often have been permeated by rain or snow in order that they will not altogether be impregnated with the noxious vapours of the factory and as a result the injurious influence of the phosphorus fumes upon the worker be further transplanted beyond the factory.

13. There is to be for every male and female worker in the dressing room for the duration of his or her work a blouse provided by the factory owner.

14. It is up to the factory owner to see that every worker before leaving the factory and at noon as well as at evening can carefully wash and cleanse his hands and face.

15. The windows in the factories are to be kept open during non-working hours as well as on Sundays and holidays; the working tables, the floors are to be scrubbed at least once a week and the walls are to be painted at least annually.

16. In order that the edibles which the workers bring along with them are not soiled by the phosphorus fumes and the dried phosphorus composition itself, with which the worker can so easily dirty his hands, eating during working hours is therefore forbidden. Hence a half hour is to be granted in the forenoon as well as during the afternoon at a suitable predetermined time in order that the workers after a careful cleansing of their hands can enjoy their bread or whatever else they have brought along for this purpose in the dressing room or out in the open without having to worry about a phosphorus poisoning. Only with the most exact application of these preventitive aforementioned measures will it be possible to eliminate the evils threatening the human health in so dreadful a manner or at least reduce them to the least harmful during the manufacture of the lucifer or friction matches.

[Free place assigned for the name of the factory owner.]

It is herewith accordingly ordered to obtain *immediately* all requirements that those enterprises already existent be instituted according to the prescribed regulations within three months against the avoidance of prescribed coercive measures. With the erection of future ones the greatest possible care is to be taken that such factory employers arrange their selected localities with respect to the above first ten points and that they do not begin work earlier, not before they have the endorsement of a local inspection committee concerning the prescribed arrangements. All other matters are to have been brought into order. Furthermore the greatest respect is to be paid to the application of the aforementioned precautionary measures. Any misdemeanor there against will be prosecuted most vigorously.

Vienna on the 7th of October 1846

[Stamp and signature]

Von der k. k. n. oe. Landesregierung.

Eine Anzeigung ist,

zum Rauchfuß gehängt, daß im Laufhause zu Lassnau zu wiederholten Malen, Mädchen im Alter von 18–30 Jahren mit unanständiger Zumuthung der Beischlafes in unzüchtige Behandlung kamen, bei denen sich eine auffallende Aehnlichkeit in Form und Verlauf der ganzen Krankheit fand. Indem die Aehnlichkeit, mit welcher dieses Uebel durch alle angewandten Hilfsmittel unaufhaltsam um sich griff und durch die gehörige Vorkehrungen desselben aufzuhalten gemacht fand man bei einer genauen Nachforschung, daß alle diese Mädchen, an einem sich dieses Übels, den Tag vor mit dem Tode endenden Uebel entwickelt hatte, Arbeiterinnen in den Schwefel-Fabriken waren, in denen die sogenannten Stein- und Schwefel-Grundschlacken verarbeitet und die Arbeiterinnen vorzüglich mit Schwefeldämpfen geschwängert waren. Auf diese Angabe gestützt, konte man mit Grund annehmen, daß diese Krankheit der Einathmung der Schwefeldämpfe in den fraglichen Fabrikslokalitäten beizumessen sei, besonders wenn man erwägt, daß die in den Schwefelgrundschlacken enthaltene Phosphor nicht gering sei und daß die Entwicklung desselben im Schwefel bei einer gewissen Temperatur hervorgerufen werde.

eine kommissarische Untersuchung der in Athen und in der nächsten Umgebung befindlichen daselbst Fabriken sah gezeigt, dass in denselben solche Einflüsse obwalten, welche mit ganz riesenmässig allgemeine Leiden begründen, dass in einer Räumlichkeit, wenn gleich langsam verlaufender Vergiftung bisweilen selbst schon in einem geringeren Grade die menschliche Gesundheit bedrohend alterirend; in einem höheren Grade aber, als dann ernstlich die Patronen der Einschreitung behufs Abhilfe werden müssen, nicht allein die Gesundheit ganz und gar untergräbt, sondern auch selbst das Leben selbst zerstört. Es erscheint somit dringend nothwendig, womöglich durch Einzugräumung der hauptsächlichsten der nachtheiligen Einwirkungen der Schädlichkeiten auf die Gesundheit der Arbeiter in den hiesigen Fabriken möglichst zu beschränken.

Das allermöglichste Abhilfe besteht aber in den Fabriken selbst in der Angelegenheit, womit man die beim Drehen der Zündhölzchen unvermeidlich sich entwickelnden Schwefeldämpfe in die Arbeitsräume sich und umgebenden entweichen lässt.

Um diesen Anfang wirksam zu begegnen, so wie die schädlichen Einwirkungen der Schwefeldämpfe auf die Arbeiter sicher zu stellen und gänzlich Alles zu vermeiden, was in Amtlich. Hinsicht bei der jetzigen fabrikmässigen der Zündhölzchen überhaupt hemmend werden könnte, sondern sich die Einrichtung in Gemässheit der seinerzeit [illegible] mit Ministerial-Erlass vom 19. Juni 1843 z. [illegible] erlassenen und unterm 8. Juli d. n. z. [illegible] bekannt gemachten, in Absicht auf die Einrichtung der Friction-Zündhölzchen fernerhin geltenden Vorschriften, nämlich folgendes zu nehmen:

1. Das Drehen der Schwefelzündhölzchen bei einem Wärmegrad über 18° R. darf nur allein in wohl eingerichteten Drehsälen mit Vorsicht eine gestattete Praxis finden.

2. Diese Drehsäle müssen absolut und jederzeit d. i. im sommer und winter, hinlänglich ventilirt sein, welche wieder mit den übrigen Arbeitsräumen

den Fabric, was mit beyfügten Abrichtungen, Anmerkungen, diese Reisen mögen billig lustbarlich schätzbar, sollen dem andern denen nützen mithalt anzuweisen Lust zu suchen und mit mehrern Lustigen denen Curiositeten, anzusehen sein, endlich gar niemand ohn Verhengnüssigung ganz denen zum Ziel gesetzten zu fallen sind, aber was selbsten dabey Observierung ohn Hindernüssen so lange gewissen und in Richtigkeit gesetzt werden müssen bis alle Observationes aus den Orten dieses wieder entfernt worden sind, wenns als noch erlaubt sein soll, dem Orte dem fallsh zu essen und die benöthigen Hinderlassen herausgenommen.

5. Soll dem Orte der Hinderlassen in dem Ort zu regulieren dass genug und wenn möglich zum bestimmten Termin die in selbe formasse gehörige Hinderlassen in den Orten bereit mögen sein, nach Hinaus nach nach geschlossenen Abziehen die innenwärts Lust mögen lassen werden soll und da selbe etwas offen gewesen Hölzer nicht genugsam wieder herausgenommen worden, bis das Zeugnuss der innenwärts Lust durch Abfassung von Luftmögenheit unterbrochen, die im Abziehen mögen samallen Hölzer herausgenommen aber mit Hülfe der Luftschlauch nach Kräften gänzlich entfernt werden sind.

6. Soll dienstens mit zu gestatten, dass der Orte Luftigkeit zu jeder Luftigen Zeit bald geöffnet, bald wieder geschlossen werden, um bald eine genugsame Luftwechselung zu machen, bald eine oder herausgenommen, zum seinen der Heizung abgestuft, die entweichlen Hölzer herausgenommen aber wieder entfernt zu haben.

7. Ist zum Orte der Hinderlassen, dass der Orte Hinderlassen Orte Hinderlassen, sind Hinderlassen werden, mögen Orte der Orte Luftigkeit abgeschlossen und so vorgenommen sein, dass Hinderlassen mögen Hinderlassen mögen sein, die mögen samallen Hölzer herausgenommen in der Orte Hinderlassen in der sein Lust mithalt zu angenehmen Abzug lassen mögen.

8. Zum Orte in dem Hinderlassen Luftigkeit, mögen Hinderlassen Hinderlassen Hinderlassen sein, so mag zur Hinderlassen

der Zimmermeister selber nur dreyßig Mann darzu verordnen müssen
welche abwechslig nach jedes ihr Tage in Dienste abzugehen
schuldig.

7. Zu Verwahrung der Pflasterzimmerey soll jeder der Pflaster-
zimmermeister selber in seinem abgesonderten Lokale hinlängliche
warten und gewölbte und bestandene Kammer, wo nebst
der guten innerlichen Einrichtung ein sonderbahres verschwiegenes
Schloß geschmiedet seyn.

8. Auch das Einkaufen der benöthigten Materialien, Holzes etc. in
die Zimmermeister selber in diesen Dingen zu geschehen.

9. Diese Arbeit muß mit einem gut gesunden und beständig offen
zu haltenden Pferd, dagegen alle Hin- und Rückgänge mit gut
gestellenden und beständig geschlossenen Thoren versehen seyn, damit, wenn aber einmal
ein Pferd oder die Pflasterzimmermeister sich entgehen, oder aber
die Arbeit daleinmal fallen, die übrigen Arbeitsleute
liegen von der dabey sich ergebenden Masse unbeschädiget
sicher gesetzlichen Dingen hinzugethan werden.

10. Zu Arbeitszeiten selber eine Lokalität bemerket
werden, welche nicht wenigstens 11 Schuh hoch und mit einem
gute beständigen Dachwerk versehen sind, so genau dass
die Einstreuungs-Oeffnungen in einer gassenden Höhe unter
wo Leute, als Einstreuungsöffnungen aber an den ab-
gegangenen Dächern und Winkel und genau oben an der Dach
rinne dass wenigstens ein oberstes Brett als Fensterl so angu-
bracht seyn, dass der nöthigen Lüftung aber die Arbeiten
genug gehindert werden.

11. Für jeden Arbeiter soll ein Pflasterzimmer von 4 Schuh im
Quadrat vorhanden seyn, damit ebenfalls wenigstens abwech-
selnd sitzend zu arbeiten wo eben Platz sey.

12. Hinsichtlich der nöthigen steinlichen soll der Fabrik-Ka-
mmer gestattet werden zur Verfertigung der Pflas-
terziegel der Arbeiter und Arbeiterinnen, so wie zum Ein-

Kleider anfallen und eigenes im Zimmer sich damit zu wechseln nicht genöthiget werden darf; sie sollen die Arbeiter ihre mitgebrachten Kleider, welche sie dann dazu dienen können, einpacken, ihre Sachen damit sie von den schädlichen Einflüssen der Fabrik nicht so ganz und gar incommodirt und die gesundheitschädlichen Einflüsse dem Fabrikgebäude nicht nachtheilig werden.

13. Die diesen Ankleidezimmer soll jeder Arbeiter der Arbeiterin für die Zeit der Arbeit ein eigenes Arbeitskleid (Blouse) von dem Fabrikherrn bestimmt werden.

14. Soll der Fabrikherr dahin sehen, daß sich die Arbeiter, bevor sie die Fabrik verlassen und zwar sowohl Mittags als Abends die Hände und das Gesicht sorgfältig waschen und reinigen können.

15. Die der Fabrik sollen die Fenster in den arbeitsfreien Tagen, so wie an den Sonn- und Feiertagen geöffnet, die Arbeitssäle, so wie der Fußboden wöchentlich wenigstens einmal gescheuert und die Wände jährlich wenigstens zweimal getüncht werden.

16. Damit die Ventilation, welche die Arbeitenden mittelungen, nicht mit Heizungsanlagen und schädlichen Gasen Verunreinigungen, damit sich die Arbeiter so lange die Räume benützen, dürfen nicht verändert werden, müssen abgeändert werden während dem Arbeit zu ändern. Dagegen müssen sowohl Vormittag als Nachmittag zu einer schicklichen, aber nie kürzer zu bestimmenden Zeit die Räume gelüftet werden, damit die Arbeitenden nach vorgenommener Reinigung der Hände ihre Kost essen oder was sie sonst zu diesem Zweck mitgebracht haben, im Arbeitszimmer oder in einem gemeinsamen Zimmer, das eine schöne Temperatur besorgen zu müssen.

Die näher der gesetzlichen Bestimmung dieser Vorschriften, wegen wird es möglich sein, den Einzelnen einzuhalten, bedarf

[illegible]

NOTES AND COMMENTS

"STUFF A COLD AND STARVE A FEVER"

STUART A. GALLACHER
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The origin or real meaning of this rather common expression is still cause for conjecture.[1] Some scholars believe the expression to be elliptical with the meaning: if you stuff a cold, you will have a fever to starve.[2] Others believe it should be interpreted literally. After investigating the possible medical theories upon which it might be founded, I believe it was meant to be taken literally. It is rather a product of lay thinking of comparatively recent times than a traditional medical maxim or popular superstition. Only one element, starve a fever, is, according to medical knowledge, justifiable to a certain degree. The elliptical meaning seems at first glance to be in harmony with medical thought, but it, too, is not fully in agreement with medical knowledge, since all colds are not without more or less fever.[3]

[1] Cf. Archer Taylor, "The Study of Proverbs," *Modern Language Forum*, XXIV (1939), No. 2, 75-6, "What does *Stuff a cold and starve a fever* mean? Probably, the two injunctions are taken literally, but they are understood by some to signify *If you feed a cold, you will have a fever to starve.* As a matter of fact, indeed, the saying is sometimes reversed and quoted as *Starve a cold and stuff a fever*, but this perhaps is the version of a fever-smitten glutton."

[2] Cf. Edward H. Marshall, *Notes and Queries*, 6th Series, III, 429, in which he suggests Socrates', πολλάκις γὰρ τό γε λιμοῦ ἀγαθὸν πυρετοῦ κακόν ἐστιν, καὶ τὸ πυρετοῦ ἀγαθὸν λιμοῦ κακόν ἐστιν (Memorabilia, III, viii. 7) [for oftentimes what is good for hunger is bad for a fever, and what is good for a fever is bad for hunger] to have something in common with the elliptical meaning of which he is in favor. See also *ibid.*, IV, 54, the assertion of E. Leaton Blenkinsopp, "I have heard it 'stuff a cold, etc.,' the expression is elliptical, for '(if you) stuff a cold, (you will have to) starve a fever.'"

[3] Cf. W. A. Wells, *The Common Head Cold and its Implications* (New York, 1929), pp. 154-5, "A cold is a fever, the inflammation being localised in the respiratory mucous membranes." See also W. G. Smillie, *The Common Cold*, (New York and London, 1937), p. 13, "Sometimes there occurs an increase to 100 degrees F. or even higher." In particular see the early opinion expressed by John W. Hayward, *Taking Cold* (London, 1873), p. 21, "The diseased states produced by taking cold are—local congestion and inflammation, and general fever."

I have been unable to find an equivalent expression in any other modern tongue which might have influenced our expression. Since the present meaning of starve (to deprive of food) and the meaning of cold (the disease) first occur in the sixteenth century,[4] the English form of our expression cannot be older than that century. The earliest examples, however, are from around the middle of the nineteenth century,[5] and, singularly, at a time when both fevers and common colds were epidemical in England.[6] These epidemics certainly afforded ample opportunity for someone to coin an expression indicative of a popular treatment for two of our most common ailments. In addition, such a simple statement is rather to be looked for when sufficient, capable medical attention is not available. Household remedies circulate rapidly in the absence of competent medical advice.

What is the historical evidence of the treatment of fevers and colds? It has been the practice since the early stages of medicine to make the patient fast or carefully feed him if suffering from a fever.[7]

[4] Cf. James A. H. Murray, *A New English Dictionary* (Oxford, 1893), II, 609, "Cold," 4 b; IX, Pt. 1, 847, "Starve," 7.

[5] Examples in writing are not numerous. Cf. W. G. Smith and J. C. Heseltine, *The Oxford Dictionary of English Proverbs*, p. 405, "Stuff a cold and starve a fever," 1852, E. Fitzgerald, *Polonius* 9; R. F. Burton, *Vikram and the Vampire* (New York, 1870), p. 61, "a fever starve, but feed a cold"; and Vincent S. Lean, *Collecteana, English and other Proverbs, Folklore, etc.* (Bristol, 1902), I, 507, "Feed a cough and starve a fever; Feed a cold and starve a fever." Lean gives no sources for his references. Cough and cold are likely variants, since one is so closely associated with the other. R. F. Burton, above, attributed the saying to the learned physician *Charndatta*. Others, as well as myself, have been wholly unable to find Burton's *Charndatta*. This physician is not to be found in copies of the manuscript Burton is supposed to have used. There are, however, two famous Indian physicians, Candrata and Cakradatta who practiced ca. A. D. 1000 and 1060. Burton might have had knowledge of either of them and added this information as pure embellishment.

[6] Cf. J. G. Townsend, *A Review of the Literature on Influenza and the Common Cold* (Washington, D. C., 1924), Supplement #48, Public Health Reports, p. 61, "Stallybrass also calls attention to the epidemic years of England, which are, 1789-90, 1802-3, 1830-32, 1840-41, 1848-49, 1854, 1869-70, etc.,,

[7] Cf. Theodor Hirsch, *Die Entwickelung der Fieberlehre und der Fieberbehandlung* (Berlin, 1870), p. 96, "In den älteren Schulen galt als Axiom, dass jeder Fiebernde auf knappe Diät gesetzt werden müsse. . . ." Cf. also W. G. Spencer, *Celsus, de medicina* (Loeb Classical Library, Cambridge, Mass., 1935), I, 233, "Hence for the first days there is to be abstinence from food; . . . . But his best

In the medicine of India one fasted to rid oneself of a fever.[8] Part of a compound Indian proverb attests this ancient and modern practice.[9] In western medicine the diet has always been an important factor. Robert Bently Todd (1809-1860) deviated from the strict dietary treatment and began to feed the fever-stricken patient, and, to be sure, he and his colleagues sometimes went to excess. Since his time, however, fevers have been scientifically fed.[10]

The common cold—*gravedo* in ancient Roman and *coryza* in ancient Greek medicine—likewise was treated by careful observation of the stricken person's diet.[11] There are no instances of stuffing, or feeding in the sense of stuffing. *Gravedo* did not imply the meaning of a person having been chilled or exposed to cold as the word

medicine is food opportunely given; the question is when it should first be given." Cf. also p. 237, "The fourth day, however, is generally the most suitable date for beginning to give food."

[8] Cf. Julius Jolly, "Medicin" (*Grundriss der Indo-Arischen Philologie und Altertumskunde*, [Strassburg, 1901]), III, Heft 10, 73, "Im allgemeinen gilt die Regel zu Anfang Fasten, späterhin Berförderung der Verdauung durch entsprechende Diät, zuletzt Arzneien, etc."

[9] Cf. Otto Böhtlingk, *Indische Sprüche* (St. Petersburg, 1873), 512, "Das Studium giebt uns Macht über die Vedas, das Fasten Macht über das Fieber, etc."

[10] Cf. Hirsch, *ibid.*, "die allgemeine Regel aber, während des ganzen Verlaufs keines acuten Fiebers jemals wirklich nährende Kost zu verabreichen, beruht sicher zum Theil auf der falschen Präsumption, dass unter allen Umständen die Oxydation der aufgenommenen Nährstoffe die Verbrennung im Körper, also auch die Stärke des Fiebers, d. h. die Temperaturerhöhung vermehren müsse. Und bei diesem Punkte ist allerdings vorzugsweise das Verdienst einiger englischen Aerzte, vor allen Todds, die alte Lehre gestürzt zu haben, wenn sie auch freilich nun oft genug in den entgegengesetzen Fehler verfallen sind." See also note 1, "Bekannt ist Todds Aeusserung, dass er als rühmendste Inschrift für sein Grab die drei Worte wünsche 'he fed fevers.'"

[11] Cf. W. G. Spencer, *ibid.*, p. 375, "In the case of gravedo, he should lie in bed on the first day, neither eat nor drink, cover the head, and wrap wool around the throat; on the next day he should get up, and still abstain from drink, or, if he must have some, take not more than one tumbler-full of water: on the third day he may eat the crumb of bread, but not much, with some small fish, or light meat, and water for drink." Cf. also pp. 371-2 for Celsus' description of gravedo, "This closes up the nostrils, renders the voice hoarse, excites a dry cough; in it the saliva is salt, there is ringing in the ears, the blood-vessels in the head throb, the urine is turbid. Hippocrates names all the above coryza; I note that now the Greeks reserve this terms for gravedo, the dripping they call catastagmus. These affections are commonly of short duration, but if neglected may last a long while. None is fatal, except that which causes ulcers in the lung.'"

cold suggests to laymen today. To be sure, the old principle *contraria contrariis curantur* [12] might imply the stuffing of colds, but, as far as I can determine, there are no medical cases recorded of its application in the treatment of colds. The reversed principle *similia similibus curantur* [13] of Paracelsus likewise is not found in the treatment of colds. Both types of thinking were property of the so-called informed physicians and were practiced by them and not the laity. Physicians are not (and were not) wont knowingly to state false doctrines as maxims, since their reputations depend upon their ability to effect a cure. It is perhaps singular, too, that nowhere is our expression commented upon by physicians in their treatment of fevers, since the element dealing with fever does not run obnoxiously counter to medical knowledge. On the other hand, when physicians speak of the treatment of colds our expression comes in for a sharp denouncement, since the element dealing with a cold is unsound.[14]

A likely theory, I believe, underlying the origin of the expression, dates from ancient times, from Hippocrates who says, "As the soil is to trees, so is the stomach to animals. It nourishes, it warms, it

[12] Cf. S. W. Lambert and G. M. Goodwin, *Medical Leaders* (Indianapolis, 1929), p. 42, "Themison (Themison of Laodicea, 123-43 B. C.) formulated this method of therapeutics by the exhibition of drugs and hygienic procedures producing conditions the opposite of the pathology theoretically inferred as existent with the phrase *contraria contrariis curantur*."

[13] Cf. *Ibid.*, p. 96, "He (Paracelsus, 1493-1541), substituted for the *contraria contrariis curantur* his own *similia similibus curantur* which later became the bone of contention in the great medical schism in American Medicine of the early nineteenth century."

[14] Cf. T. B. Rice, *The Conquest of Disease* (New York, 1927), p. 155, "For instance, we have the old advice, 'Stuff a cold and starve a fever.' This should be written 'Stuff a cold and you will need to starve the fever which follows,' if we would have it stated correctly." See also Russell L. Cecil, *Colds, cause, treatment and prevention* (New York and London, 1927), p. 88, "In mild colds diet does not play a very important part in the treatment. The patient may eat moderately of any wholesome food and feel none the worse for it. In severe colds accompanied by fever the diet should consist of liquids and soft, easily digested foods. The old proverb, 'stuff a cold and starve a fever' is unsound in that a cold should not be fed any more than is necessary. Whatever food is taken should be simple and nutritious." See also W. A. Wells, *ibid.*, "The diet should be light and free from nitrogenous foods. Nothing could be farther from the right than the injunction 'Feed a cold and starve a fever.' A cold is a fever. . . . Overloading the stomach is directly harmful. . . ."

cools; as it empties it cools, as it fills it warms." [15] In harmony with this, Hippocrates also presented regimen for winter and summer eating in which he expressed the principle of eating as much as possible in the winter to keep warm, and lightly and of limited foods in the summer to keep cool.[16] This type of logic, however, was found only among the learned of that time, and did not have common currency among the laity until more recent times. Of course, people at all times and to a certain extent have been aware of the phenomenon observed by Hippocrates, but not until the advent of scientific medicine and competent physicians who have constantly enlightened the common folk in the matter of eating has the laymen been conscious of it to any marked degree.[17] Nowadays this has become common knowledge. The layman recognizes no obstacle if one says, summer and fever signify heat, and winter and 'to catch cold' imply cold. The layman knows the respective reliefs from heat and cold, namely, little or no food and sufficient food or plenty of it.

The layman's acquisition of early medical principles has not been accompanied by a vivid realization of all their implications. He has always been notorious for his ability to think along the lines of least resistance. The layman's application of these principles then to our expression is, to reduce heat, one must remove that which produces it (starve a fever), to produce heat, fuel must be supplied (stuff or feed a cold). This is a logical solution with respect to common-folk thinking. Thus, one can say, that the principles underlying our expression are founded upon principles of medicine in its early period of development. Our expression, however, was not coined by physi-

[15] Cf. W. H. S. Jones, *Hippocrates* (London and New York, 1931), IV, 83.

[16] Cf. *Ibid.*, p. 45.

[17] The matter of proper diet has gone a step further. There are those who believe disease may be prevented by use of a 'balanced diet,' the elimination of malnutrition. There are others who discount the part malnutrition plays as a preventive measure. See W. G. Smillie, *ibid.*, p. 63, wherein, in commenting upon diet and vitamins A and D as preventive measures for colds, he says, "But there is no evidence whatever that any of these various factors prevent a cold. The well-fed, healthy youngster will, as a rule, throw off the ill effects of a cold more rapidly than the ill-nourished child that does not follow the few simple rules of good personal hygiene. However, one should not delude himself into thinking that he can prevent a cold by any known dietary regimen, not even by the highly recommended method of large doses of codliver oil."

cians. The elements of contrast, *starve*: *stuff* and *fever*: *cold* with the element of alliteration *st* (or *f* in the variants with *feed*) speak rather for a lay origin than for a learned medical one. Contrast and alliteration are elements frequently found in proverbs,[18] and are more the mark of the common folk than the learned man, notwithstanding the intricate forms of alliteration found in ancient and modern poetry.

Therefore, in the light of the above, and since our expression first occurs at about the same time that the common folk was becoming aware to a greater extent than ever before of what it thought to be good medicine, I agree with George Redway, one of the first to comment upon the expression, when he says, "a cold is to be fed, and a fever is to be starved." [19] This is the light in which the common folk understands it today and understood it years ago. The elliptical meaning is the viewpoint of those people somewhat better informed than the common folk, and it is they who read such a meaning into the proverb.

[18] Cf. Archer Taylor, *The Proverb* (Cambridge, Mass., 1931), pp. 143 and 137.
[19] Cf. *Notes and Queries*, 6th Series, IV, 54.

A YOUNG VIRGINIAN PREPARES TO PRACTICE MEDICINE, 1796-1800

WILLIAM D. HOYT, JR.
University of Virginia

The education of medical students in the eighteenth century is interesting because of the variety of experiences undergone on the road to practice. It is especially worth attention when the preparation included courses at the newly formed medical school of the University of Pennsylvania under the famous doctors Physick, Rush, Shippen, Wistar, and Woodhouse. Such was the case of James T. Hubard, of Buckingham County, Virginia, who went to Philadelphia in the autumn of 1796 to study medicine. The story of his first weeks there, and of his later establishment on his own in Petersburg, is told in a group of papers recently loaned to the Alderman Library at the University of Virginia by Mrs. D. Ellwood Davidson, of Farmville.

The first item really dates from the spring preceding the start of the Philadelphia adventure. Evidently, young Hubard had decided as early as April to embark on a medical career, for there is a list of books bought from the estate of a Lynchburg practitioner, Dr. William Irvine. These included fourteen titles, with twenty-one volumes, besides " A lot of Phamplets." There is no indication as to whether the student read the works, but he owned them at least six months before he went north.

Lynchburg 30th April 1796

Mr. James Hubard

To Est of Dor. Wm. Irvine, Dr.

1	Vo.	Clarke on fevers		£ .10.6
2	"	Reids Essays	a 17/	1.14.0
1	"	Gardner on the Gout		9.0
2	"	Desagulurs Philosophy	12/6	1. 5.0
2	"	Waller's Sydenham	12/	1. 4.0
1	"	Jackson on fevers		12.0
1	"	Farrius Medical History		10.0
1	"	Hunter on Venerial		12.6

3	"	Bergmans Chimistry	13/1	1.19.3
1	"	Duncans Medl. Cases.....		10.0
2	"	Bells Treatise on Venerial.....	10/2	1. 0.4
2	"	Rushes Enquirrus.....	7/6	15.0
1	"	Lynde on Hot Climate.....		8.0
1	"	Hills Surgery.....		7.0
		A lot of Phamplets.....		6.0
				£12. 2.7

Hubard's letter to his father, describing his journey to Philadelphia by way of Norfolk and Baltimore, and commenting on his first three weeks at medical school, is notable for the light it throws on the work performed at the University of Pennsylvania in its early days. The writer pictures his living conditions and remarks on his prospects for summer occupation, but particularly mentions each professor and some details of the classes. One gets a glimpse of Rush walking through the Pennsylvania Hospital, with the students following and observing as he spoke on the cases of the individual patients. One sees Wistar dissecting the "Fresh Subject," convincing his pupils that actual experience was the only way to learn the intricacies of the human body. One has an eyewitness view of great men at work, an inside glance which is rare for the time and the place.

Philadelphia. 11th December 1796

Hond. Sir,

I have now been here about three Weeks—Contrary to the Information of Messrs. Freeland & Gillies, I was detained four days in Norfolk, and was then obliged to take the Baltimore Packet boat. In four days I arrived at Baltimore—Set off next Morning in the French Town Packet Boat, and arrived here the next day. My Expences in getting here more than double what I expected—From Petersburg to Norfolk, 4. Dollars. For four days delay in Norfolk 4. Dollars. From Norfolk to Baltimore 10. Dollars. To Nights Staying in Baltimore 2. Dollars. From Baltimore to Philadelphia, 6. Dollars. these added to expences in Petersburg for 2 days 6. Dollars. Amount to 32. Dollars—Immediately after getting here I fixed myself in this House No. 5 Cherry Alley. I pay 5. dollars p. week for Boarding. 4/. Virg C. p. Doz. for Washing. 8. Dollars pr. Cord for firewood—8 dollars for making a suit of Clothes, 1½ Dollar for making shirts—

Tho I made it late in getting here, yet the Professors, had not advanced far

in their lectures—I attend, Dr. Woodhouse[1] on Chemistry, Rush[2] on the Institutes and Clinical Cases, Wistar[3] on Anatomy, & Shippen[4] on Midwifery & Surgery—My Tickets from these professors, together with one for Hospital Attendance, Use of Library, and the Anatomical Museum, Amounted to about 20 Virg. C.

Dr. Rush tells me that there will be not the least doubt of my graduating after attending another Course of Lectures—I cannot sufficiently admire Dr. Rush's extensive knowledge in Medicine, nor his extreme politeness and gentlemanly conduct towards the Students generally. He advised me not to attend the Lectures on the Practice of Physic and Materia Medica—until next season—And if I should not have an opportunity of attending another Course, he says, I will loose nothing by not attending these Lectures, as they are entirely such as Dr. Cullen[5] has delivered in his writings—

Dr. Wistar is certainly an eminent anatomist—His lectures on the Bones are equal it is supposed to those of Monro.[6] There is a large Collection of anatomical preparations in the Theatre—Last Monday he began the Lectures on the Fresh Subject—He began first by dissecting the parietes [?] of the abdomen. Here every muscle, was most beautifully dissected and Demonstrated—He is now demonstrating the abdominal viscera. Since I have attended the Lectures on Anatomy, I am fully convinced that a person can hardly acquire any other knowledge of the human Body by mere reading those names—

Every Wednesday and Saturday we attend Dr. Physic's[7] & Dr. Rush's

[1] James Woodhouse (1770-1809), professor of chemistry, 1795-1809, pioneer in plant chemistry, in the development of chemical analysis, in the elaboration of industrial processes, and in the use of laboratory methods of instruction in chemistry.

[2] Benjamin Rush (1745-1813), professor of the institutes of medicine and clinical practice, 1792-1813, and professor of theory and practice from 1796, probably the best known American physician of his day, extremely popular with the students who flocked to his classes.

[3] Caspar Wistar (1761-1818), adjunct professor of anatomy, surgery, and midwifery, 1792-1808, and full professor from 1808, prominent in the proceedings of the American Philosophical Society.

[4] William Shippen (1736-1808), professor of anatomy, surgery, and midwifery, 1792-1808, pioneer in teaching dissection and in organizing medical schools.

[5] William Cullen (1710-90), professor of chemistry at the University of Edinburgh, 1755-66, professor of the theory of physic, 1766-73, and professor of the theory and practice of medicine, 1773-89, the foremost teacher of medicine of his time, whose lectures inspired his students with great enthusiasm.

[6] Alexander Monro (1733-1817), secundus, professor of anatomy and surgery at the University of Edinburgh, 1755-1808, prominent student of comparative anatomy.

[7] Philip Syng Physick (1768-1837), member of the staff of the Pennsylvania Hospital, 1794-1816, and professor of surgery at the University of Pennsylvania, 1805-19, inventor of many devices and originator of improved methods for use in practice, sometimes called 'Father of American Surgery.'

Examination of the patients in the Hospital—Dr. Physic, officiates as Surgeon & Dr. Rush as physician—There are now about 50 patients there—Dr. Rush, lectures or speaks on the Case of almost every patient, and prescribes verbally; so that you must concieve this to be a fruitful source of Instruction—Since I have been here, I had the pleasure of getting acquainted with Doctr. Griffin. He enquired particularly after you—He left this place last Friday, and was obliging enough to take a letter for my Sisters—

Mr. Venable informed me to day, that it was supposed that Adams will be elected president. He also seems inclined to believe that the French will continue to commit depredations on Our Commerce. Mr. Page has not come yet. The President of the Bank of Pennsylvania, is accused and convicted of having embezzled One Hundred Thousand Dollars—A terrible fire broke out in New York last Week, which it is said destroyed five Millions of property—

I as yet have found no prospect of so situating myself as to be able to pass the Summer here—The Office of Apothecary to the Hospital will become vacant this Spring—and I expect to be nominated as a Candidate for the place—Should I be appointed, I should have the Liberty of attending all the professors, gratis, as also every other desireable privilege. I shall endeavour by steady conduct to merit the attention of the physicians & Managers—who have the power of electing an Apothecary—

I was last night chosen or elected a member of the American Medical Society—now called the Philadelphia Medical Society. I wrote a Thesis on Hydrophobia, read it and was severely examined, before my election—The Diploma of this Society is almost equal to that of Dr. of Physic—From the uncommon and unexpected expences, I have been at, I am afraid that I shall want a little farther supply—Could you Indulge me in about 25 dollars more, it will be remembered with gratitude—I expect you might exchange Cash for Bank Notes with W. Campbell. If you be so kind as to grant me this favour, be pleased to forward it Time enough to reach this about the 15 or 20 Feby.

I remain Yr. Dutiful Son

James T. Hubard

[To Col. William Hubard]

Slightly off the subject, but appropriate enough as a sidelight on the life of a medical student, is a list of clothes owned by Hubard in April 1798, while he was still in Philadelphia. The items show that the young man wore garments which were decent but not elaborate, and that his wardrobe was not very large.

List of Clothes.

9. Shirts.
4. Plain Cravats. 4. do Tamboured.
5. Silk Hndkfs.

5. pr. White silk hose. 1 Do. Striped.
5. pr. ribbd. Cotton hose. 1. Do. plain.
2. pr. Worsted elastic do.
2. Coats. &c. &c The rest I flatter
myself with being able to remember.
6. April 1798. Philadelphia.

The final paper is another letter to the father, this time written from Petersburg in the spring of 1800, after James Hubard had settled in that city to begin the practice of medicine. There is a comprehensive estimate of probable expenses, and a slightly apologetic account of the house and its furnishings, with emphasis on the "genteel" character of the articles selected. The conclusion gives a truly domestic touch: "Could you spare me half a Dozen table spoons?" The young doctor was ready to go to work.

Petersburg. 16. April. 1800—

Dear Sir,

Since my letter to you by Mr Mann, nothing of importance has occurred to me; or I should have done myself the pleasure of troubling you with a communication before this. I have not heard particularly from my Sisters since my last letter to you—and although I have used every exertion, I have not as yet been able to forward your letter to Lester Burwell—this I shall (I expect) be able to do in a few days. Indeed some opportunities have occurred but not such as I have been willing to trust, judging your letter to be of importance to each of you.

Until now I have had constant practice, but the healthiness of the season at present, allows the practitioners here but little employment. My business since new years day has amounted to about £220, with which I think I should be satisfied—considering that I am young in the business.

Directly after my last letter to you I removed from Armisteads to a House on High Street. I have a house with 2 good rooms below & one above a good Cellar, Lot of Lucern, a good kitchen, stable &c for £21 pr. annum for 3 years—I have furnished my house perhaps rather extravagantly, but not in a more tasty way, than a professional man of any Dignity should live—My furniture of every description, Breakfast apparatus, &c cost me about £75. This you will think a piece of extravagance, but I am happy to assure you, that I have paid for most of the articles in a very easy way & have got nothing but what is genteel & will answer in any future change of my way of living. I breakfast at home, & Dine at Armisteads, & keep my own horses—I calculate my expenses of every kind at about £250 pr. an. Could you spare me half a Dozen table spoons?

If possible I shall visit Charlotte next month. I remain your respectful son—

J. T. Hubard.

THE TERM "PLASMODIUM FALCIPARUM"

A Note in Defense of Dr. Welch

HENRY E. SIGERIST

Dr. Elliston Farrell drew my attention to a passage in H. Harold Scott's *A History of Tropical Medicine*[1] in which the author criticizes the term *falciparum*, and he suggested that I write a short note on the subject.

After having enumerated the various names given to the malaria parasite by Laveran, Metchnikov, Marchiafava and Celli, Osler, Grassi and Feletti and others, Scott continues:

> Strange to say, the only one which has taken root and become permanently established is Marchiafava and Celli's term *Plasmodium* and that is, really, the least suitable. Its godparents intended it to apply to the small unpigmented amoeboid immature forms of summer fever, not to the spore-forming body or the crescent. Zoologists apply, or did apply, the term *Plasmodium* to the colony formed by conjunction of numerous *Amoeboea*, each of which maintains its nucleus, *i. e.* a multinuclear protoplasmic mass. Anyway, it has now become established and we cannot alter it, nor, of course, the specific name *falciparum* for the subtertian parasite. The latter was given because of the sickle or crescentic shape of one stage in the life-history, the author of the name apparently being sufficient of a Latinist to know that adjectives in the neuter often ended in *-um*, but not sufficient to remember that 'par' does not change in the neuter and that *falciparum* would not be the nominative singular but the genitive plural.

The author of the name who was "sufficient of a Latinist to know that adjectives in the neuter often ended in *-um*" was Dr. William H. Welch. He was an excellent classical scholar and had certainly not forgotten "that *par* does not change in the neuter."

The explanation is very simple. Scott assumes that *falciparum* means crescent-like. If this were correct, his criticism would be justified. Welch, however, suggested the term in order to express the fact that this particular type of parasite was crescent-producing. In other words the term was derived not from *falx* and *par*, but from *falx* and the verb *pario peperi partum parere*. It was a construction

[1] London, 1939, Vol. I, p. 155.

analogous to the adjective *viviparus*. This is not my own supposition but was explained very clearly by Welch in his original publication.

In 1897 Welch and William S. Thayer wrote the section on Malaria for *A System of Practical Medicine* by American Authors, edited by Alfred Lee Loomis and William Gilman Thompson.[2] Welch wrote the introductory chapter on *Definition, Synonyms, History, and Parasitology*.[3] There, on page 36,[4] discussing the classification of the parasites he said:

> As it is to the group of aestivo-autumnal parasites that the crescents exclusively belong, these parasites have been described as the semi-lunar variety. They may be designated as crescent-producing. Haematozoön falciparum is suggested by the writer as a suitable technical name for this variety of parasite.

To this Welch added the following footnote:

> The name Haematozoön falciforme suggested by Antolisei and Angelini is objectionable, as it implies that the shape is always falciform, and is applicable only to the crescentic forms. The adjective "falciparum" (*falx*, 'sickle,' *parire*, 'to bring forth,' 'to produce'), on the other hand, indicates that the property of forming crescents is a distinctive character of the organism, and it is therefore applicable to the variety of the parasite which possesses exclusively this property.

One slip occurred in this footnote which however may well have been a typographical error, namely, that the infinitive of *pario* is not *parire* but *parere*.

There can be no doubt that Welch knew what he was doing when he suggested the term *falciparum* and that Scott's criticism is not justified.

[2] New York and Philadelphia, 1897-1898, 4 vols. The section on Malaria is in vol. I, pp. 17-154.

[3] It was reprinted in *Papers and Addresses* by William Henry Welch, Baltimore, 1920, Vol. I, pp. 463-531.

[4] Page 485 of the reprint.

MEDICO-HISTORICAL NEWS AND ACTIVITIES

AMERICAN ASSOCIATION OF THE HISTORY OF MEDICINE

The Association had a very successful *Annual Meeting in Atlantic City* on May 3 to 5, 1942. The attendance was not quite as large as in the preceding years but it was remarkably good nevertheless, considering the times in which we live. The Council held its Annual Meeting on Sunday, May 3. Twelve papers were presented at the two morning sessions on Monday and Tuesday.

On Monday afternoon the William Osler Medal was awarded for the first time. It went to Mr. John T. Barrett of Boston University School of Medicine in appreciation of his essay "The Inoculation Controversy in Puritan New England." Dr. Francis R. Packard delivered the Fielding H. Garrison Lecture and gave a very scholarly and witty account of "Medical Case Histories in a Colonial Hospital." This was followed by a symposium on Galileo held in commemoration of the 300th anniversary of his death in which Arturo Castiglioni, Russell L. Haden, and Leonardo Olschki discussed various aspects of Galileo's personality and work.

At the dinner session Dr. Jabez H. Elliott gave his presidential address "On Observation and Interpretation." Dr. Hugh H. Young who was scheduled to speak on "Crawford W. Long: The Pioneer in Ether Anesthesia" in commemoration of the 100th anniversary of the first application of ether anesthesia was unfortunately prevented by illness from attending the session. However he had sufficiently recovered the following day to give his address at the Tuesday morning session. Dr. T. G. H. Drake who had been delayed by a railroad accident reached Atlantic City in time to fill the gap. He spoke on "The Medical Caricatures of Thomas Rowlandson" and demonstrated colored slides which were greatly appreciated.

The Association decided not to hold any Fall Meeting this year but to accept an invitation extended by Dr. John F. Fulton to hold the Fall Meeting of 1943 at the Historical Library in New Haven and to devote this meeting to the commemoration of the 400th anniversary of the publication of Vesalius' *Fabrica*. The next Annual Meeting will take place in Atlantic City on May 2-4, 1943.

The Association unanimously elected Professor Carlos Martínez Durán of Guatemala an Honorary Member in great appreciation of his many valuable contributions to the history of medicine and particularly of the monumental History of Medicine in Guatemala recently published.

The Beaumont Medical Club of Connecticut was elected a Constituent Society, which brings the number of our constituents to 21.

The transactions of the meeting will be published in the July number of the *Bulletin*.

CONSTITUENT SOCIETIES

The Beaumont Medical Club, New Haven, Conn.

The tenth Beaumont Lecture on the William H. Carmalt Foundation was given at the Brady Auditorium, Yale University, on Wednesday, April 29, 1942. Dr. Gregory Zilboorg of New York City spoke on "Humanism and Medicine in Psychiatry." Previous to the lecture a dinner was given for Dr. Zilboorg at The Graduate Club.

The New York Society for Medical History

The Society held a meeting at the New York Academy of Medicine Building on May 7, 1942. The following papers were presented:

1. "Nikolai Ivanovich Pirogoff, a founder of modern military medicine"
Boris M. Fried, M. D.
2. "Florence Nightingale, a founder of modern military nursing"
Victor Robinson, M. D.

The Johns Hopkins Institute of the History of Medicine, Baltimore, Md.

The Third Graduate Week in Medical History was held at the Institute from April 27 to May 2, 1942, on the subject of "Contributions of Greece and Rome to Medicine." A report of the week will be published in the Annual Report of the Institute, and the publication of the papers presented during the course is being considered.

NATIONAL NEWS

New York State Medical Society

At the Annual Meeting of the Society in New York on April 29, 1942, a session was devoted to the history of medicine with the following officers: Dr. Emerson Crosby Kelly, Albany, Chairman; Dr. George Rosen, Brooklyn, Vice-Chairman; Dr. Edward F. Hartung, New York, Secretary. The following 4 papers were presented:

1. "Alexander Anderson, M. D., 1775-1870, The First Wood Engraver in America"
Walter B. Mount, M. D. (By invitation)
2. "The Yellow Fever Epidemic in New York City, 1795-1805"
Louis Faugeres Bishop, Jr., M. D.
3. "New York City in the History of American Ophthalmology"
George Rosen, M. D.
4. "Body Snatching in New York City"
Claude E. Heaton, M. D.

NEWS FROM EUROPE

England

Mr. W. R. LeFanu, Librarian of the Royal College of Surgeons (Address: Lincoln's Inn Fields, London, W. C. 2), is preparing a biography of the late Sir D'Arcy Power. He would appreciate it if letters by Sir D'Arcy or other relevant materials could be sent to him, either in originals or in copies. Originals would be copied and immediately returned.

Switzerland

Abstracts of the papers presented at the Annual Meeting of the Swiss Society of the History of Medicine and Science held September 7 and 8, 1941, in Basle have been published in *Actes de la Société Helvétique des Sciences Naturelles*, Aarau, 1941, pp. 207-222.

CORRECTION

Dr. W. W. Francis draws our attention to a mistake in the Bibliography of the Writings of Dr. William S. Thayer published in the *Bulletin*, 1936, Vol. 4, pp. 751-781. On page 773 the second item under 1920 "Sir William Osler, The Man. The Boston Evening Transcript, Jan. 5, 1920," was not written by Thayer but by Harvey Cushing.

CATALOGUES

Schuman's, 20 East 70th Street, New York: Medical Miscellany, List "E."

INDEX OF NAMES—VOLUME XI *

Abano, Petrus de, 70, 77, 392
Abascal, Horacio, 370
Abbott, Maude, 237
Abeille, Luciano, 484
Abel, 190
Abu'l-Farraǵ, 205
Abú Núwas, 201
Ackerknecht, Erwin H., 478-481, 503-521
Adair, F. L., 192
Adams, John, 263, 585
Adams, Sam, 491
Addison, 236
Aegidius Romanus, 391
Aegineta, 313
Aesculapius (*see* Asclepius)
Aetius, 48
Agrippa von Nettesheim, 116
Aḥmad ibn Yúsuf at-Tifási, 201
Albert of Montpellier, 474
Albertus Magnus, 23, 77, 88, 391
Albumasar, 77
Alden, Lyman P., 166
Alemany, *Bishop* Joseph S., 382, 383
Alizon, 373
Allbutt, 196
Allen, Charles, 344
Allendy, René, 116
Alston, Charles, 63
al-Zahawí, 208
Anderson, Alexander, 590
Anderson, William, 49, 53
Andrews, S. L., 164
Angelini, 588
Anne de Bretagne, 70
Antolisei, 588
Antonio, 217
Apuleius of Madaura, 293, 294, 297
Apuleius Platonicus, 294, 295
Aranjo, Juan Antonio de, 559
Arce, José, 484
Aretaeus, 48
Aristagora of Troixenes, 19
Aristophanes, 33
Aristotle, 19, 236, 267, 390-392
Arnald of Villanova, 23, 394
Arneth, Franz Hektor von, 181
Arnold, Benedict, 156, 158
Artelt, W., 513
Asclepius, 16, 112, 313
Aselli, Gasparo, 305, 306, 314, 319
Ashley, *Lord*, 495
Asklepios (*see* Asclepius)
Aspinwall, 247, 248
Auzout, Adrien, 113
Averroes, 203, 313
Avicenna, 201, 203, 208, 313, 392-396, 398
Ayer, Washington, 372

Back, de, 308
Bacon, Francis, 236, 486
Baillie, Matthew, 88
Baker, Henry B., 161, 165-170, 173
Baker, John, 342, 346, 347
Baker, William, 350
Balfour, Donald, 87
Ballonius, 48
Balmis, Francisco Xavier, 543-560
Bard, Samuel, 48, 487
Barnard, Henry, 247
Barrett, John T., 482, 589
Bartholin, Thomas, 307-310, 319, 321, 323, 325
Bartisch, 89
Baruch, Bernard M., 141, 142
Baruch, Simon, 142
Barzizza, Cristoforo, 389-398
Barzizza, Gasparino, 389, 390
Barzizza, Joh. Baptista, 392
Bastian, 478
Battie, 120
Baudisch, Oskar, 140, 141, 144
Beard, Charles A., 354

* Names occurring only in footnotes and bibliographies have not been included.

Beaumont, William, 114, 184
Beccaria, 489
Beddoes, Thomas, 483
Beech, J. H., 164
Beer, Joseph, 177, 178
Beers, Clifford, 126
Bell, A. N., 146
Bell, *Sir* Charles, 482
Bell, John, 137, 146, 166, 171, 184
Bellers, John, 490
Bello, Eduardo, 484
Benedict, Ruth, 509
Benites, 374
Bentham, Jeremy, 113, 232, 489, 493-495
Berdmore, Thomas, 342, 346, 347, 351
Bernadotte, 477
Bernard, Claude, 236
Bernheim, 125
Berry, Gérard du, 429
Betschard, Pater Ildefons, 116
Bettany, G. T., 63
Bigelow, L. L., 369
Bigler, Walter, 116
Billings, John S., 186, 190
Billroth, 175
Bishop, Louis Faugeres, 590
Bismarck, 232
Blanton, 345
Bleuler, 131
Boas, F., 480, 510
Bochartus, 47
Boë, Sylvius de le, 309
Boër, Lucas Johann, 178, 181
Boerhaave, Hermann, 51, 63, 174
Bolaños, Don Basilio, 545, 547
Bond, 377
Bond, Phineas, 150
Bond, Thomas, 150
Bonet, Théophile, 482
Bowers, Robert H., 69-86
Bowie, 385
Boyle, Robert, 89
Boylston, Zabdiel, 247
Bradley, 41
Bremser, 177
Bretonneau, Pierre, 53, 59, 63
Briffault, 512
Bright, Richard, 176-178, 236
Brill, A. A., 237
Broca, 125
Brockelmann, 206
Brodie, Wm., 172
Bromberg, Walter, 117-132
Brown, Harcourt, 113
Brown, John, 497
Brown, L. P., 344, 345, 351, 352, 358, 360
Brown, Walter, 172
Browne, *Sir* Thomas, 89
Bry, C. C., 517
Bryan, John, 488
Bühler, Curt F., 69-86
Burgundio of Pisa, 391
Burke, Edmund, 231
Burwell, Lester, 586
Bury, 489
Bustamente, Doña Maria, 550, 552
Byford, W. H., 192

C., Mary Margaret, 273-291
Cabanis, 119
Cabot, Richard C., 500
Cadwalader, Thomas, 150
Caelius Aurelianus, 419
Caesar, Julius, 19
Calkins, H. T., 166
Calmet, 41, 42
Campbell, W., 585
Capellini, 177
Careno, 175
Carey, Mathew, 88
Carlisle, Anthony, 370
Carro, Jean de, 175, 177
Carroll, Lewis, 129, 517
Casas, Bernardo de, 549, 550
Castiglioni, Arturo, 113, 236, 368, 482, 512, 589
Cator, D., 510
Cecil, 190
Celli, 587
Celsus, 17, 236
Cendala y Gomez, Doña Isabel de, 545
Cermisone, Antonio, 389, 394

Chadwick, Edwin, 29, 223, 232, 494-497
Chance, Burton, 482
Chapin, Edward, 378-380
Chapin, F. S., 523
Charcot, Jean Marie, 125, 514
Charles VIII, 69-86
Charles, *King* of Sicily, 205
Chaucer, 368
Cheselden, 89
Christ, 16
Christina, *Queen*, 304, 306, 307, 310, 315
Clendening, Logan, 87
Codellas, Pan S., 483
Cohen, Barnett, 237
Cohen, I. Bernard, 113
Cohn, Alfred E., 12-35
Coit, Henry Leber, 483
Cole, Beverly, 385, 387
Colombo, 305, 314
Comrie, John D., 51
Condorcet, 489
Constantinus Africanus, 22, 205, 391, 429
Cook, S. F., 543-560
Cooper, 385
Cope, John, 49
Copernicus, 46
Corde, Maurice de la, 333
Corner, George W., 368
Cowlishaw, L., 238
Crantz, Johann Nepomuk, 180
Creaser, Thomas, 245
Crespo, Don Angel, 545, 547
Cretzschmar, Philipp Jakob, 475-477
Crile, George W., 87
Crobin, G. E., 171
Crook, James K., 146
Crummer, Le Roy, 87
Cullen, William, 584
Culpeper, Nicholas, 183
Cumston, C. F., 512
Curtis, Alvin, 369
Curtis, John G., 271
Cushing, Harvey, 87, 190, 591
Cuvier, G., 476-477
D'Alembert, 489
Daniels, James, 345-347
Darwin, Charles, 27, 127-131, 236
Davidson, *Mrs.* D. Ellwood, 582
Davis, Loyal, 88
Davis, N. S., 88
Davison, Wilburt C., 182-200
Defoe, 89
Delgado, Honorio, 484
Democritus, 292, 293, 313
Descartes, 25, 236
De Tours, Moreau, 121
Deutsch, Albert, 122, 485-502
Devereux, George, 522-542
Diderot, 489
Diepgen, P., 512
Dieterich, Albrecht, 292
Dioscorides, 77, 391
Dix, Dorothea Lynde, 121, 497
Doan, Charles A., 370
Dondis, Jacobus de, 391
Dorland, 192
Dowd, Jerome, 510
Doyle, *Sir* Arthur Conan, 88
Drabkin, I. E., 112, 409
Drabkin, Miriam, 399-408, 409-436
Drake, Daniel, 184
Drake, T. G. H., 482, 589
Driberg, I. H., 510
Drummond, Alexander Monro, 63
Drummond, William, 49
Duffield, George, 164
Du Laurens, André, 319, 322
Durckheim, 480

Edelstein, Ludwig, 112
Ehrlich, Paul, 237
Eichholtz, I., 334
Elliott, Jabez H., 112, 235, 237, 368, 482, 589
Ellis, A. B., 510
Encinas, Enrique, 484
Ent, *Sir* George, 265, 269
Erasistratus, 19, 305
Eskin, A. C., 365
Eugenius IV, *Pope*, 394
Eustachio, 309
Evans-Pritchard, E. E., 505, 510

Fabrizio, 305
Fairfax, *Lord*, 136
Falloppio, 309, 314
Farington, Joseph, 114, 370
Farrell, Elliston, 587
Fauchard, Pierre, 345
Feletti, 587
Fendall, Benjamin, 342, 346, 347, 351, 353, 354
Ferber, Edna, 138
Fernel, 325
Ferriar, John, 222-227
Ferro, Pascal Joseph, 174, 175
Figrelius, O., 309
Fischer, L., 174-181
Fitch, William Edward, 146
Fitz, Reginald, 239-264
Flagg, Josiah, 347, 348
Fleury, Robert, 119
Flint, Austin, 184
Forlivio, Jacobus de, 392
Forman, Jonathan, 369, 370
Foster, Henry, 137
Fothergill, John, 48, 490, 491
Fourgeaud, Victor, 374
Fox, George, 120
Fracastorius, 236
Francis, W. W., 591
Frank, Johann Peter, 26-28, 177, 565
Franklin, Benjamin, 149, 154, 183, 253, 487, 489
Frazer, *Sir* J. G., 480, 510
Frederic II, 22
Freeland, 583
Freud, 126, 131, 478, 480, 542
Fried, Boris M., 590
Frothingham, 243
Frothingham, George E., 170
Fry, Clements C., 114
Fulton, John F., 114, 589

Galbraith, F. B., 172
Galdston, Iago, 114
Gale, Thomas, 89
Galeazzo da Sancta Sofia, 389, 397
Galen, 19, 115, 202, 204, 236, 313, 314, 325, 391, 398
Galen, Pseudo, 417, 427
Galileo, 25, 236, 237, 368, 482, 589
Gall, Franz, 122-125
Gallacher, Stuart A., 576-581
Galland, Antoine, 205
Gallegos, Miguel, 484
Galton, *Sir* Francis, 27, 127-129
Gamelin, 89
Gardette, James, 348, 349
Gardner, Frances Tomlinson, 371-388
Garrison, F. H., 48, 53, 343
Gastellier, 53, 63
Geary, Alcalde, 376
Geilinger, Max, 116
Gentile da Foligno, 391, 392, 398
George III, 121
George, Lloyd, 30
Gerard of Cremona, 205
Gibbon, 489
Gibbons, Henry, 384, 385
Gies, 345
Gillies, 583
Giovanni de Sancta Sophia, 474
Glisson, 89, 309
Godwin, 489
Goethe, 34, 489
Goldman, Leon, 369
Goodman, Herman, 369
Gordon, Bernard, 392
Gorgias of Leontium, 313
Gosch, 310
Gradis, Anthonius de, 397
Grajales, Don Manuel Julian, 545, 547
Grassi, 587
Graunt, John, 27, 28
Graves, Robert, 179
Greenwood, John, 342, 350, 353-355
Greenwood, William Pitt, 347
Gregory XVI, *Pope*, 383
Gregory, James, 63
Griffin, 585
Griscom, John, 496
Guerini, 343-345
Guicciardini, 70
Gutierrez, 48
Gutierrez y Robredo, Don Antonio, 545, 554-557

Gutmann, B., 510
Guttmacher, A., 112

Haddons, A. C., 479
Haden, Russell L., 368, 369, 482, 589
Haeckel, 130
Häfliger, J. A., 116
Haeser, 38
Hahn, 480
Hahnemann, 115
Hale, Enoch, 184
Hall, S., 536
Hall, Stanley, 130-131
Halley, Edmund, 28
Hallowell, 131
Halpern, A. M., 528
Haly Abbas, 203
Hardy, *Sir* William, 34
Harington, *Sir* John, 23
Harley, G. W., 510
Harrach, Karl Boromaeus, 177
Harriman, 266
Harris, Chapin, 364
Harris, John, 343, 350, 351
Harris, John M., 351, 364-366
Harris, Walter, 89
Harrison, William G., 236
Hartung, Edward F., 590
Harvey, Samuel C., 370
Harvey, William, 89, 236, 265-272, 305, 314, 323
Ḥasan ibn Aḥmad al-Asfahání, 208
Haslam, 120
Hauer, J. W., 510
Hause, E., 166
Havers, Clopton, 89
Hayden, Horace H., 360, 364
Haygarth, 243, 245
Head, Henry, 478, 479
Heaton, Claude E., 590
Hektoen, 190
Helmontius, 217
Helvetius, 489
Hemsterhuis, 309
Henry VIII, 486
Hepburn, Francis, 49
Heraclitus, 313
Herbertz, Richard, 116
Herder, 489
Hernandez, 550
Herodotus, 312
Herophilus, 19, 305
Herskovits, M. J., 542
Hesnard, A., 516
Highmore, Nathaniel, 89, 317, 320
Hildenbrand, Valentin von, 178
Hill, 377
Hill, Gardner, 121
Hill-Tout, C., 510
Hippocrates, 17, 19, 115, 202, 204, 231, 236, 313, 314, 324, 343, 391, 393, 579, 580
Hippocrates, Pseudo, 433
Hitchcock, H. O., 170
Hitchins, Arthur Parker, 484
Hodgkin, 236
Hoffman, 510
Hofstra, S., 510
Holman, F. A., 387
Holmes, Oliver Wendell, 184
Holt, 190, 192, 193
Home, *Sir* David, 49
Home, Francis, 48-68
Home, James, 49, 67
Homer, 17
Honestis, Christophorus de, 391
Hopkinson, Mary, 152
Horne, J. van, 307, 308, 321
Horsley, Victor, 478
Horton, L. S., 161, 162
Hosack, David, 88
Howard, Baron, 223
Howard, John, 490
Howe, Samuel Gridley, 497
Howitt, A. W., 510
Howland, John, 190
Hoyt, William D., Jr., 582-586
Hrdlicka, A., 510
Hubard, James T., 582-586
Hubard, *Col.* William, 585
Hubert, H., 510
Hume, David, 489
Hume, Edgar Erskine, 48-68, 368, 483, 484
Hunt, James, 479
Hunter, John, 89, 150, 236, 254

Hunter, William, 89, 150, 179
Hunter, William (1910), 351
Huxham, John, 48
Huxley, 129
Hyrtl, 265

Ibn Al-Jazzar, 429
Ibn al-Miṭran, 208
Ibn Sina (*see* Avicenna)
Ibráhím ibn Abí Tálib al-Ḥanáfí, 208
Im Thurn, F., 510
Irons, Ernest E., 482
Irvine, William, 582
Isaacs, M. L., 237
Iturrigaray, *Viceroy*, 545

Jaccard, René, 116
Jackson, Hughling, 478
Jacobs, Maurice S., 483
Jacquim, Jr., 177
Jäckle, Erwin, 116
Jaeger, Friedrich, 179
Janet, 126, 514
Jefferson, Thomas, 490
Jenner, Edward, 89, 174, 175, 240-264, 543
Jenny, E., 116
Jöcher, C. G., 393
Johannitius, 203, 394, 396
John of Gaddesden, 237
Jones, John, 183
Jordan, Philip D., 369
Joseph II, *Emperor*, 181
Joyliffe, George, 309
Jung, C. G., 116, 131
Juvenal, 39

Kanner, Leo, 273-291
Kant, 236, 489
Karcher, J., 116
Kardiner, A., 522
Kayser, Hans, 116
Kedzie, R. C., 165, 166, 168, 170, 171
Keefer, 188
Keller, A. G., 510
Kellogg, J. H., 166
Kelly, Emerson Crosby, 590
Kern, 178
Keynes, Geoffrey, 87
Kibre, Pearl, 389-398
Kieffer, John E., 148-160
Kingsley, M. H., 510
Kirk, 345
Kitasato, 36
Kleinschmidt, Earl E., 161-173
Knight, P. A., 172
Koch, 343, 345
Koch, Robert, 236
Kraepelin, Emil, 126, 478
Kremers, Edward, 114
Kroeber, A. L., 535
Krumbhaar, E. B., 87

Laflesche, 510
Lane, Levi, 385, 387
Langdon-Brown, *Sir* Walter, 87
Lastres, Juan B., 484
Laveran, 587
Leach, E., 171
Le Dantec, F., 516, 517
Leemans, C., 292
LeFanu, W. R., 591
Leibault, 125
Leibnitz, 236
Leikind, Morris, 237, 484
Le Maire, Joseph Jean François, 348
Le Mayeur, Jean Pierre, 342, 347-350, 354
Leonard, A. G., 510
Leonard, C. Henri, 166
Leonardo da Vinci, 25
Lesueur, Charles-Alexandre, 476
Lettsom, John C., 239, 240, 245, 251, 252, 253, 255, 260, 261, 263, 490, 491
Lévy-Bruhl, L., 480, 504, 511, 516
Lewellyn, 266
Lichtenstein, 41, 47
Liljestrand, Göran, 304-310
Lindsay, 345
Linnaeus, 44, 305
Linton, Ralph, 523, 524, 542
Lister, *Lord*, 175, 176, 180
Loch, Charles, 499-500
Locke, John, 30
Long, Crawford W., 368, 482, 589

Long, Esmond R., 114, 235
Loomis, Alfred Lee, 588
Loomis, C. Grant, 217-221
Lorinser, 564
Lovell, *Surgeon General*, 161
Lowe, E. A., 409
Lowell, A. L., 522
Lowie, R. H., 510
Lozana Perez, Don Rafael, 545, 547
Luckhardt, Arno B., 87, 114
Luther, Martin, 37, 38
Lyster, Henry F., 165, 169

McCallum, William G., 237
McCauley, 343
McClellan, Walter S., 144
MacDermot, H. E., 237
McDougall, W., 479
Mackehenie, Daniel, 484
Mackenzie, William, 178
McKeon, Richard P., 113
McLouth, L., 166
Maddox, J. L., 510
Magendie, 236
Maldonado, Angel, 484
Malfatti, 177
Malinowski, B., 539
Malpighi, 89, 236
Mann, 586
Marbode, 77
March, 345, 346
Marchiafava, 587
Mardenbrough, 247
Marett, R. R., 480, 510
Maria Theresa, *Empress*, 181
Marín, Juan, 370
Marsh, 346
Marsilius de Sancta Sophia, 391, 392, 397
Martínez Durán, Carlos, 238, 370, 589
Martius, K. F. P. von, 510
Mascagni, 89
Matas, Rudolph, 87
Mather, Cotton, 489
Mauss, M., 510
May, Charles H., 195
Mayer, Claudius F., 114, 201-216
Mayow, John, 89
Mead, 41
Medicus, Fritz, 116
Melhado, 374-377
Mesmer, 124
Mesue, Joh., 313, 393, 396
Metchnikov, 587
Meyer, A. W., 265-272
Meyer, Adolf, 126
Meyer, H., 511
Meyer-Steineg, Th., 512
Meyers, Burton D., 113
Michels, R., 516
Mier, Cosmé de, 558, 559
Mill, J. S., 232
Mill, James, 343
Miller, Genevieve, 437-473
Mills, Edwin C., 369
Milt, Bernhard, 116
Minot, George R., 87
Minto, *Lord*, 175
Mitchell, S. Weir, 88, 114, 125
Mitchell, Edwin W., 369
Mitchell, T. W., 171
Mitchill, Samuel Latham, 491
Molière, 33, 230
Mondino, 23
Monro, Alexander, 120, 584
Monroe, 343
Montagnana, Bartolomeo da, 389
Montero, Francisco, 550
Montesquieu, 489
Monzón, Don Miguel José, 552-556
Moorman, John J., 146
Moorman, Lewis J., 483
Morgagni, 89, 149, 236
Morgan, John, 148-160
Mott, Valentine, 88
Mount, Walter B., 590
Muḥammad as-Saláwí, 201
Murphy, J. B., 88
Myers, C. S., 479

Nansen, 510
Napoleon, 477, 543
Nardi, John, 270
Naylor, Mildred, 483
Nechepso, 293

Neergaard, Kurt von, 116
Nelson, 373
Nero, 48
Neuburger, M., 512
Neustätter, Otto, 36-47
Neuville, Hyde de, 476
Nicolaus of Salerno, 391
Nielsen, Aage E., 304-339
Nightingale, Florence, 27, 28, 382, 590
Nittis, Savas, 482
Norton, *Mrs.* Charles F., 366
Nothnagel, 190, 196

Ochoa, Don Ramon Fernandez, 545, 547
Oettli, Th., 116
Olschki, Leonardo, 368, 482, 589
Oribasius, 17, 411, 413, 415
Ortega, Don Pedro, 545
Osler, *Sir* William, 88, 176, 182, 190, 192, 193, 196, 237, 587, 591
Otto, Bodo, 157
Owen, Robert, 29
Oxenstierna, Axel, 307, 312

Packard, Francis R., 237, 368, 482, 589
Page, 585
Pagel, J., 512
Paine, Thomas, 347, 490
Palma, Ricardo, 484
Palmer, A. B., 163
Paltgrim, 296
Pamoleus, Franciscus, 70, 71, 77, 78, 86
Paracelsus, 24-25, 116, 134, 217, 231, 236, 484, 579
Paré, 89
Pareto, V., 536
Pasteur, Louis, 34, 236
Pastor, Don Francisco, 545, 548
Pattie, James Ohio, 371
Paul II, *Pope*, 394
Paulus Aegineta, 17
Pausanias, 18
Paz Soldán, Carlos Enrique, 484
Pearson, G., 242
Pecquet, Jean, 306-308, 321
Percival, Thomas, 492
Perez Carillo, Don Miguel, 550
Perez y Valdelomar, Don Benito, 552, 554
Peter of Mantua, 390
Peter the Great, 43, 45
Petosiris, 293, 294
Petrus Barbo, 394
Petrus Decembrius, 77
Petrus de Tussignano, 391
Petrus Hispanus, 392
Pettenkofer, Max von, 232
Petty, *Sir* William, 26, 28
Pfeuffer, 38
Physick, P. S., 582, 584, 585
Pinel, 119, 120
Pirogoff, Nikolai Ivanovich, 590
Pitcher, Zina, 161-165, 172
Place, Francis, 29
Plater, 325
Plato, 293
Pliny, 23, 77
Pope, Alexander, 489
Porro, Pietro Paolo, 204
Portenschlag, 175
Pott, Percival, 89
Poveda, Don Antonio, 552
Power, *Sir* D'Arcy, 87, 591
Preuss, K. T., 512, 513
Priestley, Joseph, 88
Prince, 126
Prochaska, 178
Proskauer, Curt, 561-575
Pudentilla, Aemilia, 296
Purves-Stewart, *Sir* James, 87
Putnam, Gideon, 137
Pye, 41
Pye-Smith, 269
Pythagoras, 293, 297, 298

Quetelet, 27, 28

Ramazzini, Bernardino, 230, 561
Ramón Beltrán, Juan, 115, 370, 484
Rand, Isaac, 257
Ransom, John E., 235
Rasis (*see* Rhazes)
Rattray, 49

Razi (*see* Rhazes)
Read, C., 510
Reclus, Elie, 480
Redmond, John, 150
Redway, George, 581
Reeves, S. J., 166
Reil, Joh. Chr., 120, 477
Reisch, 89
Revere, Paul, 491
Reynolds, 56
Rhazes, 77, 201, 203, 205, 208, 392-393, 396-398
Ricci, Seymour de, 69
Richardus Anglicus (or Parisiensis), 397
Richet, Ch., 512
Ricord, Alexandre, 475-477
Ricord, Jean-Baptiste, 475, 476
Ricord, Philippe, 476
Riesman, David, 87
Riess, Ernst, 293
Ring, John, 252, 256, 258, 261, 263
Riolan, 265, 266, 269, 319, 323
Rivers, William H. R., 478-481, 504, 510, 514
Rivet, 478
Roberts, 377
Robinson, David M., 112, 483
Robinson, J. Ben, 340-355, 356-367
Robinson, Samuel, 369
Robinson, Victor, 590
Rochambeau, 348
Roemer, Milton I., 228-234
Rogers, J. H., 381
Rokitansky, 178-180
Rolleston, *Sir* Humphry Davy, 88
Ronsil, Gabriel, 370
Rosell, Ovidio Barcia, 484
Rosen, George, 222-227, 228-234, 483, 590
Roth, W. E., 510
Rousseau, J. J., 30, 120, 489
Routh, F. C., 175
Rowell, H. T., 112
Rowlandson, Thomas, 482, 589
Rudbeck, *Bishop* Johan, 304, 305
Rudbeck, Olof, 304-339
Rush, Benjamin, 88, 148-160, 183, 230, 259, 491, 582-585
Russell, Richard, 56
Rutherford, *Sir* Ernest, 34

Sacco, 258
Sadi Pir Muḥammad Bahádur, 208
St. Francis, 21
St. Hilaire, Geoffroy, 476
St. Hildegard, 296
Salmon, Thomas W., 126
Salvani, Don Joseph, 545, 547
Santillana, G. de, 113
Sarton, George, 88
Scaliger, 204
Scarburgh, *Sir* Charles, 482
Schaefer, *Sir* E. S., 478
Schelling, 477
Schenck, 334
Scheuchzer, J. J., 39-47
Schlegel, 38
Schopenhauer, 116
Schuler, 385
Schuyler, Louisa Lee, 498
Schwartz, Louis L., 369
Scott, H. Harold, 587-588
Selden, W., 184
Semmelweis, 175
Sennert, 325, 333
Serapion, 77, 391, 396
Sextus Placitus, 421
Sforza, Francesco, 70
Sforza, Ludovico, 71
Shattuck, G. C., Jr., 184
Shattuck, Lemuel, 496
Shaw, George Bernard, 33
Shippen, Edward, 156
Shippen, Peggy, 156, 158
Shippen, William, Jr., 148-160, 582, 584
Shippen, William, Sr., 156
Shryock, Richard H., 235
Siebold, Elias von, 477
Sieroszewski, 510
Sierra, Manuel, 550
Sigerist, Henry E., 1-11, 18, 43, 112, 114, 133-147, 222, 292-303, 341, 370, 409, 475-477, 483, 484, 565, 587-588
Sighele, 517
Silvaticus, Matthaeus, 77

Sinclair, 53
Singer, Charles, 293
Sippy, Bertram W., 88
Skoda, 178, 179
Slegel, Paul Marquard, 270
Smellie, 51
Smith, George H., 114, 370
Smith, J. Eliot, 480
Smith, Peter, 376-380
Smith, Southwood, 494-496
Smith, Theobald, 237
Soemmerring, 89, 178
Soler, Miguel Cayetano, 545
Sommer, 310
Soranus, 112, 313
Southard, E., 126
Spalding, Matthias, 258
Spallanzani, 89
Spector, Benjamin, 113, 482
Spence, 350
Spencer, Herbert, 27, 129, 504, 508
Spigelius, Adrian, 325
Sprat, 113
Springer, Samuel, 156
Squire, 56
Stefano de' Dottori, 389
Steiglitz, E. J., 192
Steinen, von, 478
Stenius, 321
Stillman, J. D. B., 373
Stimson, Dorothy, 113
Stockwell, C. M., 171, 172
Stone, 510
Stout, 385
Strebel, J., 116
Strowbridge, O., 172
Suarez, Don Manuel, 553
Suarez, Juana, 553
Sudhoff, K., 512
Sue, 149
Sumarán, 551
Sumner, W. G., 510, 518
Swammerdam, 45
Sydenham, 231

Tagliacozzi, 89
Tannenbaum, Frank, 523
Tarde, 480
Taylor, M. K., 162-164
Taylor, Ralph, 369
Taylor, *Reverend* William, 375-377
Temkin, Owsei, 112, 409
Tentzel, 217
Thacher, Thomas, 183
Thayer, William S., 588, 591
Thenius, 37-38
Thomas, Edward S., 369
Thomas, Henry F., 166
Thomas Aquinas, 88
Thomas of Cantimpré, 78
Thompson, G. R., 112
Thompson, William Gilman, 588
Thomson, Stewart C., 235, 483
Thorndike, Lynn, 293, 294, 474
Thouret, 119
Tigerstedt, 310
Todd, Eli, 120
Todd, Robert Bently, 578
Toland, Hugh, 385, 387
Torrignano de' Torrignana, Pietro, 391
Townend, B. R., 344
Townsend, John, 374
Trotula, 22
Trueman, William H., 341
Turenne, Augusto, 484
Twining, Louise, 498
Tyler, James J., 369
Tylor, 480, 504
Tyndall, 27

Uexküll, 513
Upham, 369, 370
Urdang, George, 114, 482

Valsalva, 89
Van Deusen, E. H., 166
Van Swieten, Gerhard, 174
Venable, 585
Veneto, Paolo, 389
Verulemius, 217
Vesalius, 89, 116, 230, 589
Vesling, Johann, 320, 322
Vest, Walter E., 368
Vianna, A. Barboza, 484
Viau, George, 345, 348

Vico, 489
Vignati, Milciades A., 484
Vincent of Beauvais, 78
Virchow, Rudolph, 88, 230, 232, 236, 478
Virgil, 390
Vischer, A. L., 116
Vives, Juan Luis, 486
Vögelin, 44, 45
Voltaire, 120, 489, 490

Waite, 345
Wale, de, 323
Walker, Charles J., 351, 364, 365
Walker, Louise, 87-89
Walton, George E., 146
Warren, John, 88, 248
Warren, Joseph, 491
Washington, George, 136, 137, 154, 158, 348-350, 354
Waterhouse, Andrew, 249
Waterhouse, Benjamin, 239-264
Waterhouse, Benjamin, Jr., 247
Waterhouse, Daniel Oliver, 247, 248
Waterhouse, Elizabeth, 247
Waterhouse, Mary, 247
Weber, Max, 506
Wedel, Georg Wolfgang, 217-221
Weinberger, Bernhard Wolf, 340-355, 356-367, 369
Welch, William H., 236, 587-588
Weller, Sam, 249
Werner, Alfred, 141
Wesley, John, 183
West, W. C., 166
Wharton, 89
Whelpley, *Miss* F. E., 165, 170
White, Lynn, Jr., 113
Whitehead, *Prof.*, 15
Whitlock, 350
Whitney, 385
Wickersheimer, E., 293, 297
Wilde, Oscar, 179
Wilde, William, 179
Willard, 250
William of Varignana, 391
Williams, 190, 192
Williams, F. E., 511
Williams, Frankwood E., 126
Willis, Robert, 267-269
Winchell, A., 164
Winchell, N. H., 170
Wirsung, 314
Wistar, Casper, 582-584
Withering, William, 89, 483
Witherspoon, John, 157
Wolf, Rudolf, 43, 46
Wood, Casey A., 88
Woodhouse, James, 582, 584
Woods, Alan C., 235, 483
Woodville, W., 242, 243, 247
Woodward, C. M., 166
Wright, J., 510
Wüstenfeld, 206

Yersin, 36
Young, Hugh H., 368, 482, 589

Zilboorg, Gregory, 235, 590
Zimmerman, Leo M., 235
Zuñiga, Francisco, 558

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CONTENTS

Historical Inter-relationships between Medicine and Social Welfare: ALBERT DEUTSCH 485

Problems of Primitive Medicine: ERWIN H. ACKERKNECHT ... 503

Primitive Psychiatry II. Funeral Suicide and the Mohave Social Structure: GEORGE DEVEREUX 522

Francisco Xavier Balmis and the Introduction of Vaccination to Latin America: S. F. COOK 543

TEXTS AND DOCUMENTS

A Civil Ordinance of the Year 1846 to Combat Phosphorus Necrosis: CURT PROSKAUER 561

NOTES AND COMMENTS

"Stuff a Cold and Starve a Fever": STUART A. GALLACHER 576

A Young Virginian Prepares to Practice Medicine, 1796-1800: WILLIAM D. HOYT, JR 582

The Term "Plasmodium Falciparum," A Note in Defense of Dr. Welch: HENRY E. SIGERIST 587

MEDICO-HISTORICAL NEWS AND ACTIVITIES 589

INDEX OF NAMES 592

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VOLUME I

ORNITHOLOGISTS
OF THE
UNITED STATES ARMY MEDICAL CORPS
THIRTY-SIX BIOGRAPHIES

BY

EDGAR ERSKINE HUME
Colonel, Medical Corps, United States Army

WITH FOREWORD BY

ALEXANDER WETMORE
Assistant Secretary of the Smithsonian Institution
In Charge of the U. S. National Museum

In the last century the United States Army played a great role in the opening up of the West. It was employed not only to protect the settlers from hostile Indian tribes but also to explore and survey the unknown territory. This presented a unique opportunity for the observation of animal and plant life and resulted in the discovery of many new species.

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